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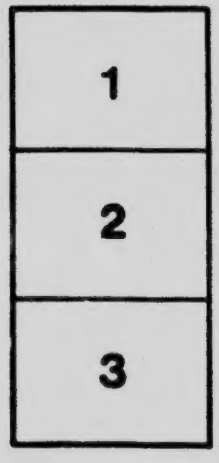

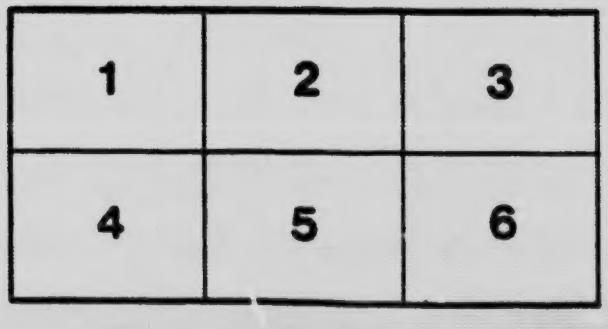

MENTAL DEFICIENCY

(AMENTIA)

TYPES OF BRAIN CELLS OCCURRING IN AMENTIA.

(Drawn as seen under $\frac{1}{12}$ inch oil-immersion lens.)

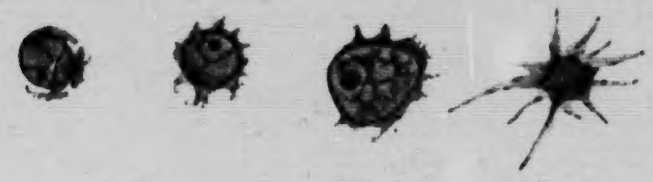

FIG. 1. FIG. 2. FIG. 3.

FIG. 4.

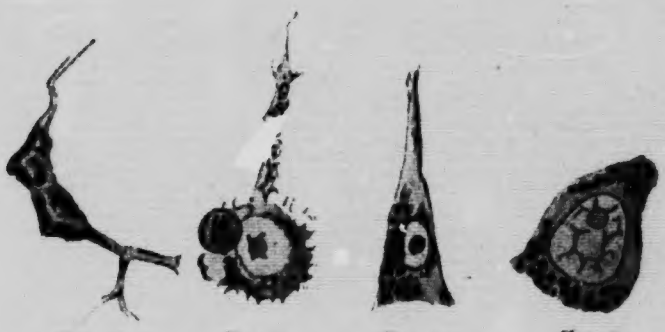

FIG. 5. FIG. 6. FIG. 7. FIG. 8.

A. F. Tredgold del. 1908.

FIG. 1.—Incompletely developed nerve cells (neuroblasts), from layer of small pyramids of frontal cortex.

FIG. 2.—Incompletely developed nerve cell, from middle pyramidal layer of motor cortex.

FIG. 3.—Neuroglia cell; from a case of sclerotic amentia.

FIG. 4.—Incompletely developed nerve cells, from layer of middle pyramids of frontal cortex.

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FIG. 8.—Pigmented cell of hippocampus; from a case of amentia with epilepsy.

MENTAL DEFICIENCY

(AMENTIA)

BY

A. F. TREDGOLD 1870-

L.R.C.P. LOND., M.R.C.S. ENG.

CONSULTING PHYSICIAN TO THE NATIONAL ASSOCIATION FOR THE FEEBLE-MINDED, AND TO THE LITTLETON HOME FOR DEFECTIVE CHILDREN: LECTURER AT THE MEDICAL GRADUATES COLLEGE, LONDON: FORMERLY MEDICAL EXPERT TO THE ROYAL COMMISSION ON THE FEEBLE-MINDED: RESEARCH SCHOLAR IN INSANITY AND NEUROPATHOLOGY OF THE LONDON COUNTY COUNCIL AND ASSISTANT IN THE CLAYBURY PATHOLOGICAL LABORATORY: LATE RESIDENT CLINICAL ASSISTANT IN THE NORTHUMBERLAND COUNTY ASYLUM, ETC.

SECOND EDITION

REVISED AND ENLARGED

TORONTO

THE MACMILLAN COMPANY OF CANADA, LTD.

1914

TO

ALL THOSE PERSONS OF SOUND MIND

WHO ARE INTERESTED IN THE WELFARE

OF THEIR LESS FORTUNATE FELLOW-CREATURES

093

PREFACE TO SECOND EDITION

THE sale of the whole of the first edition of this book, its very favourable reception by the Press, and the kind letters regarding it which I have received from many well-known members of the profession, lead me to think that it has filled a want in the literature of psychiatry, and embolden me to publish a second edition.

The present edition has been thoroughly revised, many chapters entirely rewritten, and a new one added dealing with mental tests and case-taking; whilst the passing of the Mental Deficiency Bill has enabled me to give an account of those changes in the law of England which cannot fail to bring mental defectives into close relationship with the medical profession.

The ramifications of the subject of mental deficiency are now so numerous and its literature so extensive, that it is impossible to refer to all the work which has been done during the past five years. I hope, however, that nothing has been omitted from this edition which is original and of practical importance, and I trust that it will still continue to be of use to all those who are called upon to deal with this class.

I gratefully acknowledge my indebtedness to my friend Dr. R. Langdon Down for his kindness in reading through several chapters, and for much valuable criticism and advice.

A. F. TREDGOLD.

GUILDFORD, SURREY,
January, 1914.

PREFACE TO FIRST EDITION

DURING the past few years the subject of mental deficiency has evoked a large amount of attention from many prominent persons interested in social and philanthropic questions. To members of the medical profession in particular it is one of much importance, on account of their responsible duties connected with its diagnosis, with the treatment and training of these patients, and their examination and certification as to fitness for special classes and schools, training-homes, and asylums. And there is no doubt that with new legislation, which cannot now long be delayed, these duties and responsibilities will be considerably increased.

For these reasons I venture to hope that the account which I have attempted to give in these pages regarding the incidence, causation, pathology, mental and physical characteristics, social relationship, diagnosis, prognosis, and treatment of persons suffering from mental deficiency, will be found to justify its publication.

To a great extent this account is based upon observations and researches which I have been making for close on ten years, but I have also made full use of, and frequent reference to, the writings of many other workers in this field. Valuable help, permission to examine cases, and make use of notes and illustrations, has been generously accorded me from many quarters. In particular I would like to take this opportunity of gratefully acknowledging my indebtedness to the members of the Asylums Committee of the London County Council; also to Dr. Francis Warner, London; Dr. G. A. Sutherland, London; Dr. John Thomson, Edinburgh; Dr. F. W. Mott, F.R.S., Pathologist to the London County Asylum and Director of the Pathological Laboratory; Dr. R. R. Alexander and Dr. P. Baily, Hanwell Asylum; Dr. W. J. Seward, Colney

Hatch Asylum; Dr. J. M. Moody, Cane Hill Asylum; Dr. Robert Jones, Claybury Asylum; Dr. T. W. McDowall, Morpeth Asylum; Dr. F. R. P. Taylor and Dr. C. A. Marsh, formerly of Darenth Asylum; Dr. C. Caldecott, Earlswood Training Institution; and Dr. R. Langdon Down, Normansfield Training Institution.

The greater portion of the microscopical work was carried out in the Claybury Pathological Laboratory, during my two years' tenure of the London County Council Research Scholarship in Insanity and Neuropathology; and to the unequalled advantages which this scholarship afforded for clinical and pathological research in these fields of medicine I desire to pay a grateful tribute.

Finally, I wish to express my indebtedness to the recently issued voluminous Reports of the Royal Commission on the Care and Control of the Feeble-Minded. Of the mass of information contained in these, regarding the number and condition of the mentally deficient population of this country, I have made full use. It is necessary, however, to add a word of explanation with regard to statistics. Under the term "mentally defective" the Commissioners include sane epileptics. Since, in my opinion, these should not rightly be classed as aments, I have considered it advisable to make independent calculations from the original returns—hence the slight discrepancy between the two sets of figures.

A. F. TREDGOLD.

September, 1908

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MENTAL DEFICIENCY

CHAPTER I

THE NATURE OF MENTAL DEFICIENCY

LITERALLY, the term "mental deficiency" is just as applicable to a decay as to a non-development of the mental powers, to the dotage of old age or disease as to idiocy from birth, and it is still often used indiscriminately of either of these conditions. There is, however, a great difference between them. Mental defect occurring subsequently to mental development may be compared to a state of bankruptcy, and is more fittingly described as *dementia* (*de*, down, from; *mens*, mind); whilst the person whose mind has never attained normal development may be looked upon as never having had a banking account, and this state is designated *amentia* (*a*, without; *mens*, mind). In both of these, of course, there is literally mental deficiency; but in view of the convenient and growing tendency to restrict this term to the latter class, I shall in this book use it in a specific sense as synonymous with "amentia."

Mental deficiency, or amentia, then, is that state in which the mind has failed to attain normal development. But the question at once arises, What is "normal" mental development? for there is probably nothing in which human beings differ more than the degree of their mental capacity. All civilized nations are composed of men of very varying grades of intellect. At the one extreme we have the genius of a Bacon, Newton, Kepler, Copernicus, Shakespeare, Goethe, Plato, or Galileo. These are succeeded by individuals of lesser but still conspicuous ability, and these again merge into the ordinary average mass of mankind. Below this we have a section composed of persons of inferior intelligence whom we

may term "dullards." The dullards are followed by the class designated "feeble-minded"; the feeble-minded merge imperceptibly into the imbeciles, and these again are connected by insensible gradations with the idiots. The gross idiot is characterized by a complete negation of intellect, and thus stands at the lowest extreme of mental development.

Now, since these variations of intellectual development appear to form such a continuous series, and since corresponding differences occur among uncivilized as well as civilized peoples, it might be thought that they were all simply manifestations of that tendency to vary which is the rule in every form of life. That, in fact, they were all oscillations within the normal range of development, and that gross idiocy was just as much an expression of normal variation at one end of the scale as was genius at the other. Theoretically this view is very plausible, and it must be admitted that the differentiation of mild defect from the lowest grade of non-defect may be sometimes difficult to make; nevertheless, I believe that close investigation will show that a real dividing-line does exist, and that this is of such a nature as to justify our regarding mental deficiency as no form of normal variation, but as a distinctly abnormal and pathological condition.

What is this dividing-line? What is the difference between the mind which we may regard as normal and that which we may rightly consider to be abnormal and defective? It is obvious that the question is one of considerable scientific and social importance; nevertheless, it is one upon which authorities are by no means agreed. As is well known, mind is the sum total of many complex functions and faculties, and the ideal mind would be the one in which all these were developed in due and harmonious proportions. But such a mind has no real existence; at any rate, no one would admit that the mind of anyone but himself came up to this standard, and it is obvious that were the "ideal" to be taken as the criterion of normality, all the universe would be defective. Another standard which has attracted considerable attention in recent years is the pedagogic one, and it is now often contended that the criterion of mental defect is inability to reach a certain degree of scholastic proficiency. But I find it impossible to subscribe to this dictum. Undoubtedly inability to progress in school is a very common characteristic of aments, but by no means invariably so, and there are persons whom every mental specialist would agree in classing

as defective who yet possess very considerable scholastic attainments, which may be greater, indeed, than some members of the non-defective class. On the other hand, there are many individuals who have been complete failures at school, who can yet look after their interests, earn their living, and discharge their duties in one of the humbler walks of life with complete success. Whilst, therefore, admitting the value of scholastic tests as an adjunct to diagnosis, I cannot agree that they form a criterion by which the normal may be differentiated from the abnormal mind. Wherein, then, does this difference lie ?

In seeking for a division which shall be natural, scientific, and of practical social utility, it seems to me essential that we should as far as possible distinguish between those aptitudes which are fundamental and those which are not so. The innate developmental potentiality of mind causes many individuals to acquire aptitudes which may not only be a source of pleasure and advantage to themselves, but which may conduce very materially to the benefit and progress of the community in general. The creations of the artist, musician, and poet, the inventions of the scientist, even the theological doctrines of the devout, are instances in point. But although innate capacity of this kind is necessary for the advance of the race, one would not be justified in considering those in whom it was lacking as mentally deficient, for it can hardly be regarded as a fundamental quality of the human mind. Conversely, the presence of ability of this kind is not in itself proof of the non-defectiveness of the person concerned. If, however, we find that a class of human beings exists who are devoid of what we may justly regard as the *essential* qualities of mind, then we are entitled to say that to that class the term " mentally deficient " may rightly be applied. The crucial question therefore is, What is the essential purpose of mind ?

I think it will be generally conceded that the chief requirement of all living beings is the power of maintaining existence. Other attributes may be advantageous and desirable, indeed necessary, to a progressive evolution; but this one is fundamental. In the lower forms of life Nature provides a variety of means whereby the individual is enabled to secure food, to escape its enemies, and to conform to its environment—and thus to survive. The unconscious mimicry of many insects, the powerful weapons of offence possessed by many of the carnivora, such defensive appliances as

stings, spines, a horny integument, the emission of disagreeable odours, the possession of limbs adapted for speed, together with the highly developed instincts which are present in so many of the lower forms of creation, are well known, and reveal the devices of Nature to attain this essential object of life.

With the appearance of man, however, a new phase is entered upon. The alterations of anatomical form, physiological function, and general mode of life have combined to rob him of most of the means of survival possessed by the lower orders of creation, and have resulted in his being no longer able to hold his own without something to take their place. Deprived of natural weapons of offence, he can only secure food through cunning and inventiveness. Having no natural weapons of defence, he must have recourse to skill and strategy if he would escape his enemies. Driven by force of numbers to distant climates, intelligence and reason must guide him in storing food and devising bodily covering if he is to evade starvation and death from exposure. It may be, indeed it is likely, that the bodily alterations and changes in mode of life to which I have alluded are not the cause, but the consequence, of man's mental evolution. The result, however, is the same, in that with man the maintenance of existence has ceased to be a matter of brute force, unconscious adaptation, and instinct, and has become a conscious process; it is in fact the essential concern of mind. I regard this capacity, therefore, as the fundamental quality of the human mind. Other attributes may be of advantage in furthering individual progress, but this one is essential; the individual who possesses it must be regarded as " normal," whilst the one in whom it is lacking falls so far short of the minimum developmental stage of the human species that he must be regarded as abnormal and mentally deficient.

It may be urged, however, that this criterion is fallacious, inasmuch as the maintenance of existence is not dependent upon mental faculty alone, but upon the nature of the environment. For instance, very little capacity might be needed to ensure survival in an equable climate, devoid of foes, and with an abundant supply of food to hand; whilst the greatest intelligence might not suffice to preserve the life of an individual cast alone upon a barren island. Again, in a civilized society the environment differs enormously with different individuals; and whilst the lot of some (even defective) persons may be so favourable as to render their survival a matter of the greatest

ease, individuals not essentially lacking in this capacity may fail to maintain existence owing to economic pressure or other adverse social influences. Lastly, since the conditions of life vary greatly with different phases of man's social evolution, it may be said that the capacity necessary for survival can never be a fixed amount, but must undergo a corresponding change, with the result that an individual who would be classed as abnormal and defective amid a civilized population might be regarded as non-defective among a community of savages, and that persons who to-day are regarded as normal, might, in a more advanced stage of social evolution, be classed as defective.

These arguments deserve attention, but I think a little consideration will show that they are not really valid objections to the conception of mental defect which I have endeavoured to formulate. In the first place, it is obvious that ability to maintain existence must be judged in reference to circumstances which normally obtain, not to an environment which is grossly exceptional. It is perfectly true that a state of affairs might be imagined in which survival needed no capacity beyond that possessed by some high-grade aments; indeed, such a state actually exists in the case of many defectives who are so placed that they do not have to compete for a living with their fellow-creatures. But such conditions are far removed from the competition and struggle for existence which is the normal lot of mankind, and there can be no doubt that under these latter circumstances failure would be the inevitable result. Again, with regard to economic pressure, it is unfortunately true that the state of the labour market may, and frequently does, result in a section of the community finding it impossible to make both ends meet without occasional assistance from external sources. But the criterion of deficiency is that it is due to inherent, not to external or social, defects; that it is psychological, not economic; and there is not as a rule much difficulty in distinguishing between the two. With regard to the nature of the demands made upon the resources of the individual by alterations in the organization and development of society, there can be no doubt that a great change has taken place; but it by no means follows that because the adaptation required is different in kind, it therefore necessitates any higher mental capacity. Indeed, on the whole it seems likely that, in consequence of the more specialized and stereotyped mode of life, survival becomes progressively easier

as the race advances from a primitive condition towards one of civilization.

As will be seen in discussing the psychology of the defective mind, the precise nature of the mental defect is subject to considerable variation in different individuals. In every case, however—and this is the point I here desire to emphasize—it is such as to render the person incapable of adapting his conduct and mode of life to any environment which is not of an absolutely simple and stereotyped character. The character of the environment must, of course, have some bearing on the matter, and when that age comes in which social reform shall have succeeded in completely neutralizing the force of natural selection, in abolishing the advantages which now result from initiative, industry, and intelligence beyond the average, and in reducing life to a form of existence in which the doings of every hour from birth to the grave are carefully prescribed and supervised by an omniscient Government, then the mentally defective person will be quite capable of competing on equal terms with any member of the community. In the absence of such a stereotyped existence, however, and so long as survival demands, not merely ability to labour, but the prudent regulation of conduct in accordance with surroundings which vary from day to day, the mentally deficient will be incapable of so competing, for in the capacity for such adaptation to changing surroundings he is inherently defective. As things now are, and as they have been since the days of primeval man, human environment has been of this latter kind, survival has necessitated the presence of a capacity for adaptation, and I think we are therefore justified in looking upon this as the fundamental quality of mind. Where it is present I regard the individual as of " normal " mental development, albeit his range of intelligence and degree of accomplishments may vary within very wide limits, thus constituting variation within the normal. Where it is absent, I regard the individual as abnormal and mentally deficient, whatever other accomplishments he may possess. In a former edition of this book I adopted as the criterion of defect the inability of the individual to perform his duties as a member of society in the position of life to which he was born, but further consideration has caused me to think that this is too narrow, that it does not allow for those frequent slight variations within the family (deteriorations, if we like to call them so) which are within the normal compass of oscillation; accordingly,

I now suggest as the standard that of ability to maintain existence without external support.

Now, the normal child comes into the world in a very immature condition. He is quite incapable of independent survival, and it is only after many years of training, after reiterated precept and example, only too often after painful and bitter experience of the consequences attending mistakes, that he gradually learns so to adapt his conduct to his environment as to be capable of standing alone. Superficially considered, there would appear to be a considerable resemblance between the various stages of normal evolution and the different grades of mental defect, and hence it is not perhaps surprising to find that the degrees of amentia have been regarded as simply due to normal development being arrested at corresponding periods of growth. The newly born normal child has even been spoken of as an idiot. I think this view is most fallacious. In spite of his immaturity, the normal child possesses a potentiality for development which is far removed from that possessed by the abnormal, and this suffices to place the incapacity of the latter on a totally different plane to the stage of incapacity through which every healthy person passes in the course of his development. It is perfectly true that in aments, as in the non-defective, training is essential to bring out their potentiality. The inherently defective child who does not receive this training may remain so undeveloped as to rank little higher than an idiot, whilst a similar child, under suitable training, may have his faculties so developed as to be merely feeble-minded. Admitting this, however, it must be quite clearly stated that the difference between the normal and abnormal lies not in the training they have received, but in their innate capacity to respond to this training. The mentally deficient person is one in whom this innate potentiality is so limited that no education and no training can avail to render him capable of the adaptation necessary for independent survival. It is therefore necessary to bear in mind that, although it may be convenient to compare the various grades of mental defect with various stages of normal mental growth, this restricted potentiality for development in the ament constitutes a most important difference; whilst, in view of this, the application of the term "idiot" to the new-born normal child can only be regarded as a gross abuse of language.

It is sometimes stated that the essential basis of amentia lies in

the non-evolution of certain mental characteristics which are necessary to secure adaptation under modern conditions—that, in short, whilst the generality of mankind have advanced in mental capacity, aments represent an atavism, or harking back, to a more primitive human condition. Apart from the fact that amentia is not confined to civilized man, but occurs among primitive races, and probably even amongst the lower animals, I find it exceedingly difficult to believe that the mentally deficient members of a civilized community would be any better able to hold their own amid a community of savages than they are in their present environment, and I find it still more difficult to imagine that such persons represent a developmental phase in the evolution of the human race. In short, when we come to study the defective mind, we find that not only is it characterized by a lack of power for acquiring the fundamental aptitude for which mind exists, but that such growth as is present is extremely likely to be irregular and distorted. The lower members of the normal, as represented by the dullards, may be unable to make any social advance. They are heavy, stolid, and dull-witted; but they yet possess sufficient power of adaptation to look after their interests and to hold their own unaided. The mild aments, on the other hand, may show no apparent dulness, they may even be bright and vivacious, and in some of their accomplishments immeasurably superior to the dullard, but the other faculties of their minds are not present in like proportions. Instead of harmonious working, there is mental discord, and in the possession of the power so to adapt their conduct to their environment as to maintain an independent existence they are fundamentally lacking, and the want can never be supplied. It is the recognition of this irreducible minimum which enables us to draw the line between the normal and the abnormal, between the physiological and pathological, and which justifies us in designating persons who fall short of it as suffering from deficiency of mind. The condition is a psychological one, although the criterion is a social one, and we may accordingly define amentia as *a state of restricted potentiality for, or arrest of, cerebral development, in consequence of which the person affected is incapable at maturity of so adapting himself to his environment or to the requirements of the community as to maintain existence independently of external support.*

The two other chief forms of mental disease are dementia and insanity. The former of these has already been referred to, and

is the result of neuronic degeneration; whilst "insanity" is the clinical manifestation of a disturbance or perversion of neuronic function, which may or may not terminate in degeneration, and which, as we shall subsequently see, is by no means incompatible with neuronic deficiency or amentia.

* * * * *

I think it will be evident that the condition of amentia, whilst presenting many interesting problems to the physician, the pathologist, and the psychologist, has also a much wider interest and importance. Since in Man the predominant feature is Mind, and since it is by the development of this faculty that human progress has taken, and must take, place, it is clear that the question of its disease, and particularly of its defect, is one of supreme importance to the statesman, the sociologist, and the philosopher.

CHAPTER II

INCIDENCE

THE enumeration of the mentally deficient population of any country is an extremely difficult matter, and there can be no doubt that most official inquiries, particularly those by means of the ordinary census, fall very far short of the truth. The reasons for this are numerous, the chief being the inability or unwillingness of parents to recognize mental abnormality, their total incapacity to distinguish between its various forms, and their not unnatural reluctance to proclaim its presence on a census paper. The milder forms of defect, which are at once the most frequent and the most important from a sociological aspect, cannot possibly be detected by such means. For these reasons I am of opinion that the official returns of any country respecting the number of its aments are so unreliable and incomplete that no useful purpose would be served by quoting them.

Investigations of the English Royal Commission of 1904.

In this country, however, an enumeration has recently been made on quite another basis. In the year 1904 a Royal Commission was appointed to consider the existing methods of dealing with these persons, and the Commissioners decided that, before any practical scheme of administration could be formulated, it was imperative that they should obtain approximately accurate information as to the number and condition of the class. The Commissioners remark: "Almost at the outset of our inquiry we found that there were no available statistics from which any trustworthy estimate could be made as to the number of persons who might be said to fall within one or other of the categories named in our reference. We decided, therefore, that an expert investigation of the matter was indispensable." With this object, a series of personal

investigations were instituted on a considerable scale, and this is the first systematic attempt which has been made to obtain reliable data. It is not too much to say that these inquiries have added enormously to our knowledge regarding the condition, manner of living, and environment of the aments of this country, besides making it possible to calculate their total number with a degree of accuracy hitherto unattainable.

The method adopted by the Royal Commission consisted of a series of elaborate and searching inquiries by a number of medical men, to each of whom a selected area was assigned. The investigator was instructed to visit personally all public elementary schools, poor-law institutions, charitable establishments, training-homes, reformatories, common lodging-houses, prisons, idiot asylums, hospitals, and, indeed, any establishment likely to harbour the mentally abnormal. Further, he was to see persons in receipt of outdoor relief, to apply to the clergy, medical practitioners, the police, charity organization societies, and similar agencies, and, in short, to make use of any and every channel which might help him to make the enumeration complete.

It was not found practicable to investigate the whole of the country in this way, but in order that conclusions applicable to the entire country might be drawn, a selection of certain typical areas was made. Altogether, there were examined nine areas in England, two in Wales, one in Scotland, and four in Ireland, having an aggregate population of 3,873,151.

It is extremely gratifying to be able to state that the majority of the recommendations of the Royal Commission have now received the sanction of Parliament, and although the Mental Deficiency Act of 1913 cannot be regarded as a final settlement of the question, it is certainly a measure which cannot fail to operate to the advantage of the defectives themselves and of the whole community.

I shall again allude to many facts revealed by this inquiry in subsequent chapters; but in this place some statistics regarding the ascertained number of aments may be quoted.

The total number of aments varies in the different areas examined, and although to a slight extent this may be due to different personal equations, in many cases the difference is so great that it can only be regarded as the result of a real difference of incidence. This is shown in the following table:

TABLE I.*

SHOWING THE TOTAL NUMBER OF AMENTS, AND OF IDIOTS, IMBECILES, AND FEEBLE-MINDED RESPECTIVELY, PER 1,000 POPULATION, IN CERTAIN DISTRICTS OF THE UNITED KINGDOM, ACCORDING TO THE INVESTIGATIONS OF THE ROYAL COMMISSION, 1904.

		Idiots.	*Imbeciles.*	*Feeble-minded.*		*Total Aments.*
				Adults.	Children.	
Urban ..	Manchester ..	0·05	0·32	1·20	2·10	3·74
	Birmingham ..	0·09	0·27	1·70	1·60	3·76
	Hull	0·02	0·20	0·55	0·58	1·35
	Glasgow ..	0·07	0·23	0·32	1·00	1·68
	Dublin ..	0·19	0·57	1·20	2·10	4·14
	Belfast ..	0·13	0·63	0·70	0·97	2·45
Industrial..	Stoke-on-Trent	0·21	0·45	2·10	1·10	3·86
	Durham ..	0·02	0·34	0·56	0·56	1·48
	Cork	0·07	0·32	0·16	0·54	1·10
Mixed Industrial and Agricultural	Nottinghamshire	0·30	0·66	1·50	1·20	3·81
	Carmarthenshire	0·59	0·65	0·51	1·20	3·05
Agricultural	Somersetshire	0·18	1·00	2·10	1·10	4·54
	Wiltshire ..	0·35	0·69	2·20	0·90	4·25
	Lincolnshire ..	0·44	0·98	1·40	1·70	4·68
	Carnarvonshire	0·24	0·58	2·10	0·94	3·96
	Galway ..	0·13	1·00	1·00	2·20	4·49

It will be seen from this table that, whilst the mean average incidence of amentia in the sixteen areas is 3·28 per 1,000 population, the variation ranges from a minimum of 1·1, in the case of Cork, to a maximum of 4·68 in the case of Lincolnshire. The following table shows the areas grouped according to the prevalence of amentia:

* The figures in this table slightly underestimate the true incidence for the reason that they do not include a small proportion of cases certified under the Lunacy Act.

TABLE II.

SHOWING THE RELATIVE INCIDENCE OF AMENTIA IN CERTAIN AREAS OF THE UNITED KINGDOM.

Low Incidence (*under 3 per 1,000 Population*).	*Mean Average Incidence* (*3 to 4 per 1,000 Population*).	*High Incidence* (*over 4 per 1,000 Population*).
Hull	Manchester	Dublin
Glasgow	Birmingham	Somersetshire
Belfast	Stoke-on-Trent	Wiltshire
Durham	Nottinghamshire	Lincolnshire
Cork	Carmarthenshire	Galway
	Carnarvonshire	

It is thus seen that the incidence of amentia in this country is far from being uniform; that, in fact, great differences exist between areas in which there is little difference in physical, social, and industrial features. By means of the annual reports of the Lunacy Commissioners I have ascertained that the same applies to the incidence of insanity, and that, on the whole, there is a tolerably close correspondence between the relative extent of the two conditions (amentia and insanity). The cause of this differing prevalence of mental disease is not clear, and its investigation would probably necessitate very minute inquiries into the social, industrial, and hereditary condition of the people over a long period. Since, however, it relates rather to mental disease in general than to amentia in particular, it is beyond the scope of this work to do more than allude to it.

The Number of Aments in England and Wales.

If the incidence of amentia were tolerably uniform throughout the country, it would be a very simple matter to calculate the total number of affected persons from the figures revealed by this inquiry; but, as we have seen, the incidence is very far from being uniform. It would also be quite easy could it be shown that the proportion of low to high prevalent areas in those examined were relatively the same as obtains in the whole country—if, in fact, we could be certain

that we were dealing with a fair sample—but there is no *a priori* evidence that this is so. Consequently the estimation is a somewhat complicated one. I believe, however, that by using the incidence of insanity as a standard we may arrive at a result which is approximately correct. All insane persons are not, of course, certified, but the returns of the Lunacy Commissioners regarding the number of the certified pauper insane may be accepted as a sufficiently accurate indication of the *relative* prevalence of insanity in the various union districts of England and Wales. The incidence of amentia, as already remarked, is, on the whole, directly proportionate to the incidence of insanity. Now, if we calculate the proportion per 1,000 population of the certified pauper insane in the eleven areas of England and Wales investigated by the Royal Commission of 1904, it works out at 3·15; but if we calculate the proportion per 1,000 of the certified pauper insane throughout the country (using in each case the returns of the Lunacy Commission* and the population according to the 1901 census†), it works out at 3·42. So that the mean average incidence of insanity, and consequently of amentia, in these areas is less than the mean average for the entire country, and this can only be due to the fact that the eleven areas examined contain a greater relative proportion of districts of low incidence.

The actual number of aments in the country is therefore expressed by the equation:

$$\underbrace{\text{Aments : certified insane}}_{\text{in areas examined}} :: \underbrace{\text{aments : certified insane}}_{\text{in England and Wales}}$$

From which it follows that the total number of aments in England and Wales on January 1, 1906, was approximately 138,529 persons, equivalent to (with an estimated population on that date of 34,349,435, according to the Registrar-General) 4·03 persons per 1,000, or 1 in every 248.

* Total pauper certified insane in England and Wales on January 1, 1906, according to the Sixtieth Report of Lunacy Commissoners = 111,256. Total pauper insane in the areas investigated, as obtained from Table I., Appendix B, of same report = 7,328.

† Population of England and Wales, according to 1901 census = 32,525,716. Population of the eleven areas examined, according to 1901 census = 2,321,567

The Number of Persons suffering from Each of the Three Degrees of Amentia in England and Wales.

This also may be calculated from the statistics of the Royal Commission, and the results arrived at are shown in the following table:

TABLE III.

APPROXIMATE ESTIMATION OF THE TOTAL NUMBER OF AMENTS, AND OF THE RESPECTIVE DEGREES, EXISTING IN ENGLAND AND WALES ON JANUARY 1, 1906.

(*Estimated Total Population according to Registrar-General*, 34,349,435.)

Idiots	..	8,654	persons, or 0·25	per 1,000	population.
Imbeciles	..	25,096	,, 0·73	,,	,,
Feeble-minded	Adults ..	54,114*	,, 1·57	,,	,,
	Children ..	50,665	,, 1·47	,,	,,
Total	..	**133,529**	,, **4·03**	,,	,,
			(or 1 person in every 248).		

The Relative Incidence of the Three Degrees of Amentia.

It is seen from Table III. that *idiots* are decidedly the least numerous of the three degrees of amentia; that *imbeciles* occur next in frequency, being nearly three times as plentiful; whilst the number of the *feeble-minded* is more than three times as great as the idiots and imbeciles combined. In other words, taking the country as a whole, there are *in every* 100 *aments*:

Idiots.	*Imbeciles.*	*Feeble-minded.*	
		Adults.	Children.
6	18	39	37

Or, *in every* 10,000 *population* there are (taking the nearest whole numbers):

Idiots.	*Imbeciles.*	*Feeble-minded.*		*Insane.*
		Adults.	Children.	
2	7	15	14	36

* It seems probable that the excess of adult over juvenile feeble-minded is due to the inclusion in the former group of 4,450 patients in asylums. The majority of these belong to the mildest type of mental defect, and are detained on account of insanity or epilepsy. If seen during the school period, they would probably be looked upon as doubtful, and given the benefit accordingly. Their condition becomes obvious when competition with the outside world has to be faced.

There are, however, certain variations in the relative incidence of these degrees of amentia which seem to be referable to the environment, and to these brief allusion must be made. It is found that the severer degrees of defect (idiots and imbeciles) are both relatively and absolutely much more numerous in agricultural than in urban and industrial areas, whilst in the case of the juvenile feeble-minded (mentally defective children) the results are reversed, these being both relatively and absolutely more numerous in urban than in agricultural areas. The actual figures will be seen by reference to Tables I. and IV.

TABLE IV.

SHOWING THE RELATIVE INCIDENCE OF THE DEGREES OF AMENTIA IN CERTAIN DISTRICTS OF THE UNITED KINGDOM. CALCULATED FROM THE RETURNS OF THE ROYAL COMMISSION, 1904.

		In Every 100 *Aments there are*—			
		Idiots.	Imbeciles.	Feeble-minded.	
				Adults.	Children.
Urban	Manchester	1·5	8·6	31·0	57·0
	Birmingham	2·5	7·2	45·0	44·0
	Hull	1·5	7·8	44·0	46·0
	Glasgow	4·3	13·7	19·4	62·6
	Dublin	4·6	14·0	30·0	51·3
	Belfast	5·3	25·9	29·0	39·5
Industrial	Stoke-on-Trent	5·3	11·4	53·0	30·0
	Durham	1·5	23·0	37·0	38·0
	Cork	6·7	29·0	15·0	49·0
Mixed Industrial and Agricultural	Nottinghamshire	8·1	17·0	41·0	32·0
	Carmarthenshire	14·0	22·0	18·0	44·0
Agricultural	Somersetshire	4·0	23·0	47·0	25·0
	Wiltshire	8·3	15·0	52·0	23·0
	Lincolnshire	9·5	21·0	31·0	37·0
	Carnarvonshire	6·0	14·0	55·0	24·0
	Galway	2·9	22·8	23·7	50·5

Inasmuch as the inquiries from which these statistics are compiled excluded all persons certified under the Lunacy Act, there is a slight fallacy in these figures. In order to ascertain the extent of

this, I made a special investigation as to the *total* number of aments (certified and uncertified) in a few of the areas examined. The results show that the proportion excluded does not appreciably alter the relative incidence as shown in Table IV. The cause of this difference of relative incidence will be discussed in a subsequent chapter.

Incidence of Amentia Relative to Insanity.

It has been stated that the incidence of amentia is directly proportionate to that of insanity, and on the whole this is true; for it is found that where insanity is rife amentia is also prevalent, and, conversely, where there is little insanity there is little amentia. The inquiries of the Royal Commission show, however, that the relative incidence of these two forms of mental disease is subject to slight variations according to the environment, and, generally speaking, amentia would appear to be relatively more prevalent in rural, and insanity in urban, districts.

The aments are a slightly more numerous class than the insane, for a calculation of the total number of the latter (uncertified as well as certified) shows that the approximate number of this class in England and Wales on January 1, 1906, was 125,827, corresponding to 3·66 per 1,000 population, or to 1 person in every 273.

The approximate total number of persons suffering from all forms of pronounced mental disease (amentia, insanity, and dementia) in England and Wales in 1906, therefore, is 264,356, equivalent to 7·69 per 1,000, or 1 person in every 130.

Location.

In order to give a general idea as to the location of these aments I append the following table (V., p. 18), which shows the situation of the 8,079 persons revealed by the inquiries of the Royal Commission, together with those not so included on account of being certified under the Lunacy Act.

Incidence with Regard to Sex.

The sex of the 12,120 aments discovered in sixteen areas of the United Kingdom is as shown in Table VI.

It is there seen that, considered either in regard to each degree or

collectively, there is a slight preponderance of the male sex, the relative proportion of males to females being practically as 6 to 5. It is probable that of all aments born a considerably greater proportion than this are of the male sex; but that the number of these is subsequently diminished by a relatively higher infantile mortality. It is of interest to note that the ratio of males to females is highest of all in the group of feeble-minded children, in which there are approximately 3 males to 2 females.

TABLE V.

SHOWING THE LOCATION OF ALL AMENTS IN ELEVEN SELECTED AREAS OF ENGLAND AND WALES. MAINLY BASED UPON THE INQUIRIES OF THE ROYAL COMMISSION, 1904.

	Feeble-minded.		*Imbeciles.*	*Idiots.*	*Totals.*	
	Juvenile.	Adult.			Persons.	Per Cent.
(*a*) In institutions:						
Poor Law	83	1,387	152	47		
Charitable*	34	115	—	—		
Idiot asylums ..	3	22	60	15	2,866	32·5
Lunatic asylums ..	—	366	276	92		
Prisons	—	197	—	—		
Inebriate homes ..	—	17	—	—		
(*b*) In receipt of outdoor relief	10	358	237	103	708	8·0
(*c*) Not receiving relief:						
1. Friends able to make partial or full permanent provision ..	50	234	138	72	494	5·6
2. Friends unable to make permanent provision	217	926	434	147	1,724	19·5
(*d*) In public elementary or special schools ..	2,936	11	74	—	3,021	34·2
Totals ..	3,333	3,633	1,371	476	8,813	

* Charitable institutions are composed as follows:

Institutions for the blind, deaf, crippled, epileptic, and defective 21 persons.

Training and rescue homes, penitentiaries, etc., 128 persons.

That a greater number of aments are to-day resident in institutions than was the case a generation back is, I think, incontestable, and the exigencies of modern life must undoubtedly lead to an increase of this number in years to come; but as to whether the

TABLE VI.

SHOWING THE SEX OF AMENTS.

	Idiots.	*Imbeciles.*	*Feeble-minded.*		*Totals.*
			Children.	Adults.	
Males..	303	959	3,244	2,179	6,685
Females	282	848	2,193	2,112	5,435

condition is or is not more prevalent than formerly, or as to the relative incidence in different countries, we have no data upon which to form an opinion. It is quite clear, however, from the statistics here given, that even on account of its present prevalence the condition is one deserving the gravest consideration.

CHAPTER III

CAUSATION

AMENTIA has been defined as a state of imperfect or arrested cerebral development, and in the investigation of its causes we have to inquire into all the influences concerned in embryonic development, as well as those affecting the growth of the brain after birth. In other words, we must ascertain as completely as possible the family and the early personal history of these afflicted persons. Now, such an inquiry is by no means easy; it requires not only a considerable amount of special knowledge in order rightly to interpret the accounts furnished by unscientific, and often ignorant, persons, but it also demands much patience and tact. The not unnatural reluctance evinced by the majority of persons to admit the presence of mental unsoundness in the family often leads to the deliberate withholding of information, whilst a strongly prejudiced view of the importance of some one particular factor may cause all others to be ignored, and so greatly mislead the investigator. I do not think there is any disease in which, in the minds of parents and relatives, the *post hoc ergo propter hoc* opinion figures more largely.

Nevertheless, a very large number of cases have now been examined, and although the opinions of inquirers differ slightly as to their relative importance, there is a very general agreement as to the main influences which are responsible for the imperfect condition of the brain cells.

It would be too large a task to refer to all the work which has been done in this direction, even in this country alone; and as I have myself devoted much time to the subject, and have investigated the antecedents of a large number of these patients, I propose to give my own results, alluding where necessary to the points upon which they differ from those of other inquirers. My reason for doing this

is that the question of causation not only involves the ascertainment of facts, but the careful analysis and consideration of such facts in conjunction with the clinical features of the patients, and I feel more competent to do this with data personally collected than with those obtained by other persons. My investigations embrace patients seen in the asylums of the London County Council, the special institutions at Darenth and Earlswood, the Littleton Home for Defective Children, and my own private practice, and they include every grade and variety of amentia. This point is important because the type of case varies much in different institutions, and statistics, however numerous, which are confined to any one institution, are apt, on that account, to be misleading.

General Considerations.

In dealing with this subject it has been customary for writers to divide cases of amentia into two groups—namely, "congenital" and "acquired"—according to whether the condition was present at birth or arose from the operation of causes after birth. It is clear, however, that from both the scientific and practical aspects, the real question is that of the respective influences exerted by heredity and environment, and regarding this the terms "congenital" and "acquired" may give rise to considerable misconception. For instance, a congenital condition may be caused by a factor of the environment acting during uterine existence, and therefore really be acquired; whilst it often happens that mental defect may not show itself until several years after birth, and thus apparently be acquired, although it is actually due to innate causes. For these reasons I have thought it better to discard these words entirely, and to use instead the terms *intrinsic* and *extrinsic*.

Under the former heading—intrinsic—I include any variation or pathological condition of the germ plasm which results in imperfect development of the brain, and this variety of amentia I term intrinsic, or *primary*. Mental defect of this kind is therefore a result of inheritance, although, as will subsequently be seen, it may not be actually "hereditary" in the strict sense of that word. By extrinsic causes I mean any factors of the environment which are capable of prejudicially affecting the brain development of the offspring after conception has taken place; in other words, of producing somatic modifications. These factors may be intra- or

extra-uterine, and this variety of amentia I term extrinsic, or *secondary*.

I propose first of all to allude to some general considerations regarding the etiology of amentia. I shall subsequently give a more detailed account of the chief intrinsic and extrinsic factors which have been found to be associated with this condition.

The Relative Influences of Inheritance and Environment.

One of the most important practical questions is that of the effects produced by inheritance and environment respectively.

In the investigation of individual cases the proportion in which some adverse condition of the environment is alleged as the cause is very considerable; and, bearing in mind that evidence of this kind is much easier to elicit than are details of the family history, it is not surprising that many former writers should have attributed great importance to such factors. At the beginning of my inquiries I was inclined to do so myself, and it was only when I found how frequently morbid inheritance lay behind that I came to a different conclusion. I am far from denying that the environment, even in the presence of innate tendencies to defect, has no influence. What I wish to point out, however, is that mental defect is but rarely caused by injurious external factors acting alone, and that in an overwhelming proportion of cases the cause lies in the condition of the germ plasm.

This question has such important sociological bearings that it will not be out of place to quote some of the evidence tendered to the Royal Commission on the Feeble-minded regarding it.*

Professor Sir T. Clifford Allbutt said: "I regard feeble-mindedness (if not accidental) as always hereditary. . . . I have never met with a case of manufactured feeble-mindedness apart from some accidents either at birth or afterwards." Dr. H. Ashby, speaking of all grades of mental defect found in early life, said: "In at least 75 per cent. of the children with amentia that I have examined there was a strong probability that the amentia was hereditary and primary." Dr. Ashby further stated that he had observed no special tendency in the children of alcoholics, or of women who suffer privation during pregnancy, or in those children who live in unfavourable conditions subsequent to birth, to develop amentia.

* Report of the Royal Commission on the Feeble-minded, vol. viii., chap. xxvii., 1908.

Dr. Bedford Pierce stated that he considered heredity to be " by far the most important factor, and relatively more important in mental enfeeblement (amentia) than in insanity." Dr. Bevan Lewis said: " There is not the least doubt of it in my mind. I look upon feeble-mindedness as a germinal variation." Mr. Frederick Wilkinson, Director of Education, Bolton, stated that in almost every case where parents of mentally defective children appeared before the committee or before magistrates, it was found that the parents themselves were similarly afflicted, and he adduced evidence in support of this statement.

Similar evidence, attested by numerous cases, was tendered to the Royal Commission by Dr. F. W. Mott, Dr. Hubert Bond, Dr. James Kerr, Dr. Fletcher Beach, Sir James Crichton-Browne, Dr. Beresford, Dr. Scott, Dr. Parker Wilson, Dr. Sherlock, Dr. Smalley, myself, and several others; whilst Professor Sir E. Ray Lankester and Dr. Archdall Reid, dealing with the problem from the biological aspect, agreed that the great majority of cases of mental defect were innate and transmissible.

Practically the only evidence submitted to the contrary came from Dr. C. Mercier, Dr. Eichholz, and Dr. R. Hutchison. Dr. Mercier admits the importance of heredity in the production of the more severe grades of amentia (idiocy and imbecility); but considers that the environment may play an important part in the causation of the milder degree of feeble-mindedness. Dr. Eichholz's evidence related to the children attending special schools, but since he stated that from 40 to 50 per cent. of these children recovered under care and training, it is obvious that his remarks do not apply to the really mentally defective.

It is quite clear, therefore, that there is now an overwhelming body of evidence from those qualified by experience to express an opinion on this matter, to the effect that in the great majority of cases of amentia the condition is due to innate or germinal causes, and that it is transmissible. This was the finding of the Royal Commission.

The Nature of the Germinal Defect.

The exceedingly interesting and important question now arises, What is the nature of this germinal impairment? In a certain proportion of cases the mental defect of the individual has been preceded by a similar defect in his ancestors, and it may then be

regarded as a definite instance of " heredity " in the strict meaning of the word. But this is by no means always the case; indeed, it is not even the rule, and in my experience it is commoner for the ancestors of defectives to suffer from such conditions as insanity, epilepsy, dementia, and allied psychopathological states, than it is for them to be actually mentally deficient. It is obvious that the repeated occurrence of such conditions as these in a family, the members of which live in an environment which does not differ essentially from that of the mentally normal, must be indicative of a germinal variation; but it has been contended that it is erroneous to say that the defect of the offspring is " hereditary," since it is not *identical* with the ancestral condition.

I must confess that this appears to me to indicate some confusion of thought as to the real nature of the inheritance underlying this condition. Heredity has been aptly defined by Professor J. A. Thomson* as " the genetic relation between successive generations." The medium of this relationship is the germ cell; but the rôle of the germ cell is not to transmit organs and tissues already laid down in miniature, as was formerly thought, but simply to hand on certain tendencies to development. The researches of Mendel and those subsequently conducted on similar lines, have shown that it is highly probable that the germ cell contains within it a series of forces, or " determinants," which direct and control the development of each separate organ and tissue of the body. Undoubtedly the influence exerted by these controlling forces, as we may regard them, is very considerable. They may, on the one hand, be so potent that a certain development will ensue whatever the nature of the environment; on the other hand, the tendency to the development of a particular quality may be so defective that no condition of the environment will avail to bring that quality into being Familiar instances of this are seen in the pigmented epithelium of the negro and the absence of pigment of the albino. But the germ cell would seem to be the seat of directive forces, of tendencies to development, not of definite qualities, and in most instances the realization of these tendencies depends, in more or less degree, upon the particular environment attending the individual whilst development and growth are taking place.

The conclusion to which I have come is that amentia must be regarded, not as due to the absence or suppression of some specific

* J. A. Thomson, " Heredity," London, 1908.

germ determinant, but as resulting from a diminished germinal vitality, in consequence of which development tends to be incomplete. This lessened potentiality is especially marked in that constituent which determines the development of the central nervous system—the neuronic determinant—but it is often more widespread, and then affects other tissues of the body also. In other words, the inheritance takes the form of a *neuropathic diathesis*, or an innate predisposition to neuronic imperfection; the actual manifestation of this innate weakness, however—that is, the form it assumes—being often dependent upon the nature of the environment.

In investigating the family histories of persons suffering from amentia, insanity, epilepsy, or other manifestations of this neuropathic diathesis, it is not unusual to find that whilst many members of the stock present psychopathic or neuropathic anomalies, there are yet others who do not appear to differ from the ordinary healthy members of mankind. This phenomenon is a very puzzling one; it is clear that germinal impairment is present, because the non-affected members of the family may, and frequently do, have descendants who are markedly abnormal. It is possible this result may be due to the transmission taking place in accordance with Mendel's law, and I shall refer to this point presently; but I am disposed to think that the suggestion I have made as to the result being influenced by the environment is the more likely explanation. With regard to insanity, for instance, there is no doubt that whilst a predisposition, in the great majority of cases, is essential, yet some exciting cause in the shape of ill-health, intoxication, severe stress or strain, is usually necessary to determine the attack. It may well be that in a family characterized by the neuropathic diathesis there will be several members whose circumstances and mode of life are such that the necessary excitant does not occur, with the consequence that they pass muster as normal individuals.

In the case of amentia it seems probable that we have to do with a still more marked germinal impairment, and, as a matter of fact, although what may be termed " sporadic " cases of primary idiocy frequently occur, a close examination of the brothers and sisters of the affected individual will usually reveal some indications of neuronic abnormality. It seems to me probable that here also the environment plays a part, and that the result, whether mental adequacy or inadequacy, very often depends upon some adverse external factor. I am disposed to think that one of the commonest

of these factors is the physical condition of the mother during gestation. Obviously this is a matter upon which it is often difficult to obtain precise information; but I have been much struck by the fact that many isolated cases of idiocy, occurring in a family with only a slight neuropathic predisposition, have been associated with some abnormal condition of the mother whilst she was carrying the child.

Apparently, under these less-pronounced conditions of germinal impairment, the germ cell, although to a certain extent vitiated, is still capable of proceeding to the perfect structural development of the embryo, provided no untoward circumstances intervene to further embarrass its growth; but should there happen at this time any deterioration in the health of the mother, whereby the blood supplying the rapidly growing ovum is considerably modified in its nutritive qualities, then incomplete development is very likely to occur. As far as my experience goes, the physical condition of the mother is of far more importance than her mental state, except in the cases in which this may modify the physical condition.

In other instances the same result is attained by a somewhat different contributing or, as it may be termed, exciting factor. A fairly common example is premature birth; if by any unfortunate chance this should happen where there are already present predisposing factors, even if slight, the child is extremely likely to show some mental deterioration as compared with his brothers and sisters. In other cases prolonged labour, attended with more or less asphyxia, may act in the same manner; the temporary obstruction of the cerebral circulation need not be enough to give rise to any actual lesion, or in a healthy child to produce any damage whatever, but in the present instance it is all that is required to interfere with the perfect development of the nerve cells, and some degree of weak-mindedness is the result.

In the same way act some of the factors occurring after birth, such as trauma, convulsions, rickets, infectious fevers, meningitis, etc. It will be seen that in the larger proportion of these cases ancestral defects are present, and the exciting factor simply acts as the last straw upon the already enfeebled developing neuroblasts. This it may do by causing a temporary derangement of the circulation or metabolism of the brain. But although in some cases an "adverse environment" (using this term in its broadest sense) may be the sole cause of amentia, and in others a not unimportant con-

tributing cause, the net result of my inquiries has been to convince me that in the great majority of persons who suffer from mental defect the real underlying condition is impairment of the germ cell of the nature I have described.

The Origin of the Germinal Impairment.

We have now to ask, To what is the germinal impairment due? for the cause of this will be the real *fons et origo mali*.

There is probably no biological problem of greater interest and importance, and about which less is known, than that of the causation of germinal variations—whether of a progressive or retrogressive nature. The explanation usually forthcoming is that they are spontaneous. This was the view advanced by the Royal Commission, which declared: "Both on the ground of fact and of theory there is the highest degree of probability that feeble-mindedness is usually *spontaneous* in origin—that is, not due to influences acting on the parent—and tends strongly to be inherited."

One is irresistibly reminded of, and unable to refrain from quoting, the words of Huxley on this matter. In his "Essay on Perpetuation of Living Beings," Huxley said: "The third cause that I have to mention is a very extensive one. It is one that, for want of a better name, has been called 'spontaneous variation'; which means that when we do not know anything about the cause of a phenomenon, we call it 'spontaneous.' In the orderly chain of causes and effects in this world, there are very few things of which it can be said with truth that they are spontaneous. Certainly not in these physical matters—in these there is nothing of the kind; everything depends on previous conditions. But when we cannot trace the cause of phenomena, we call them 'spontaneous.'"

To say that amentia is "spontaneous" in origin, therefore, is but a confession of ignorance. It may be that our present knowledge does not suffice to enable us to answer this question; but at any rate hypotheses may be suggested which, if they serve no better purpose, may yet be of service in stimulating further research.

One view, which has probably occurred to most thinkers on the subject, is that aments may be the products, not of a new variation, but of the perpetuation of a strain which has been defective from the beginning. As is now generally admitted, civilized man has arisen from a simian ancestry by the gradual evolution of more complex and higher type of organization. In other words,

he has gradually developed a series of mental functions and faculties which were lacking in the apes, but which have now become an essential part of normal mankind. Accordingly it may be argued that persons suffering from mental defect are not so in consequence of any recent germinal impairment, or of any reversion even, but simply because they are the descendants of a simian strain which was fundamentally incapable of evolving beyond a certain phase.

This view has recently been put forward by Dr. Charles B. Davenport,* who says: "The conclusion is forced upon us that the defects of this germ plasm have surely come all the way down from man's apelike ancestors, through two hundred generations or more. The germ plasm that we are tracing remains relatively simple; it has never gained, or only temporarily, at most, the one or the many characteristics whose absence we call (quite inadequately) 'defects.' Feeble-mindedness is thus an uninterrupted transmission from our animal ancestry. It is not reversion; it is direct inheritance."

Interesting as this hypothesis is, it is one to which I cannot subscribe. It seems to me, from what we know regarding the wonderful "adaptive force" of the germ plasm, that the presence in certain stocks of such an inability to progress would denote a distinct germinal abnormality, so that, even if this hypothesis were granted, the problem of origin is not explained; it is only pushed back "two hundred generations or more." But if this evolutional incapacity of the germ plasm were really present in certain apes, one cannot help wondering how their descendants evolved into human beings at all; or, having so evolved, how they managed to survive amid the ruthless natural selection which was certainly operative in the dawn of human existence. It is doubtless true, as Dr. Davenport says, that a continuous trail of defects may sometimes be traced back for six or seven generations; for natural selection has for some time been rendered nugatory by civilization, and defectives are now enabled to survive who would formerly have perished; but my own investigations show it to be equally true that germinal defect may make its appearance in a stock which, so far as can be ascertained, has been previously sound.

It is often said that mental defect is an example of atavism or reversion, and ingenious, but quite incorrect, parallels are drawn of the resemblances between the intellectual and social aptitudes of an ament and those of an ape or a prehistoric man. As already

* "The Origin and Control of Mental Defectiveness," 1912.

remarked, I look upon mental defect as due to an inherent inability to attain to the developmental stage which is "normal" in the race, and it is quite true that a certain psychological likeness may exist between some aments and some of the inferior races of mankind, such, for instance, as the South Sea Islanders or the Bushmen; but atavism, in the words of De Vries, is the falling back to a prototype, that is, to "those ancestors from which a form is known to be derived," and it by no means follows that these primitive peoples are in the direct line of descent; they may equally well be degenerate offshoots from the main stem, and I certainly very much doubt whether the phylogeny of civilized man was ever represented by a phase of evolution comparable with that of mental defect.

In short, I regard the germinal variation present in these persons as a pathological one; as being of the nature of a vitiation, which, instead of being of "spontaneous" origin, is really due to a negation or diminution of spontaneity. How, then, is this impairment brought about? I consider that it is primarily due to the action of the environment.

This view is one which I have held and stated for many years; but I must admit that it is regarded as highly heterodox by many biologists, besides being deprecated by the Report of the Royal Commission on the Feeble-minded. The chief objections urged against it are, *firstly*, that "the teaching of biology is opposed to the possibility of such a connection"; and, *secondly*, that the theory may be traversed by many arguments to the contrary.

The first of these objections is an *a priori* one, and apparently runs thus: That since the germ plasm has now been shown by Weismann to be "continuous" and not manufactured anew by each individual, any acquirements of the somatic cells can have no influence upon it—therefore the germ plasm is immutable. Or, in the words of Weismann: "It is an inevitable consequence of the theory of the germ plasm, and of its present elaboration and extension so as to include the doctrine of determinants, that somatogenic variations are not transmissible."* I am not concerned with the transmission of such acquirements as the docking of dogs' tails. the nose-slitting of savages, the systematic compression of the cranium, or circumcision, because I do not consider that primary amentia comes into this category at all. It is probable that such localized acquirements are *not* transmissible, although the last word

* A. Weismann, "The Germ Plasm: a Theory of Heredity," 1893.

on this subject has not yet been said, as has been well shown recently by Professor Hartog.* The question is whether certain particular morbid states of the body may so affect the germ plasm as to bring about pathological variations; also whether the same result may follow adverse environmental influences acting *directly* upon the germ plasm.

It is worthy of note that in his more recent works Weismann himself has admitted such a possibility, and not only is it inconceivable that it should be otherwise—that the germ plasm should live a charmed life amid all the changes taking place in the fluids by which it is bathed and upon which it is dependent for its sustenance—but many facts have now been adduced demonstrating that such modification of the germ plasm does actually take place. As was remarked by Beard,† who has made a most valuable research on this subject, "the germ cell must react to and be influenced by its environment."

This question is one of such extreme interest and importance that it will not be out of place to refer to a few of these facts. One of the earliest inquiries was that of Dr. Constantin Paul‡ regarding the effect of lead. This observer found that out of 32 pregnancies in which the *father alone* suffered from lead-poisoning, the mother being free from that condition, 12 of the offspring were stillborn, 8 died during the first, 4 during the second, and 5 during the third year of life, whilst another one died later in childhood. Similar data regarding workers exposed to the fumes of nitrate of mercury have been published by Lizé.§ Out of 12 pregnancies in which the father alone was exposed, there were 4 stillbirths; of the remaining 8 children, 3 died before the fourth year, and only one could be described as vigorous. Sullivan quotes a case, described by Marfan, of a man who, after having two healthy children, acquired the cocain habit, and whilst suffering from the symptoms of chronic poisoning engendered two idiots.

The toxic effects of alcohol upon growing protoplasm are well known, and since the use of this is very general and experimenta-

* M. Hartog, "Problems of Life and Reproduction," 1913.

† J. Beard, "A Morphological Continuity of Germ Cells as a Basis of Heredity and Variation," *Review of Neurology and Psychiatry*, vol. ii., 1904. See also J. Loeb, "Experimental Study of the Influence of Environment on Animals," 1909. Also H. M. Vernon, "Variation in Animals and Plants," 1903.

‡ Constantin Paul, "Plumbism and the Fœtus," Paris, 1861.

§ Lizé, *Union Médicale*, 1862.

tion with it is comparatively easy, it is but natural that it should have formed the subject of many inquiries. It was shown by Féré,* of Paris, that the effect of the vapour of alcohol upon incubating eggs was to produce 63 per cent. of normal births, 16 per cent. of incompletely developed embryos, and 21 per cent. of monstrosities and chickens of "idiotic and imbecile grade." If the experiments were made with alcoholic solutions of absinthe, the effects were still more marked, there being but 25 per cent. of normal births, 31 per cent. of incompletely developed, and 44 per cent. of abnormal and defective chicks. Combemale† found that pups begotten on a healthy bitch by an alcoholized dog were congenitally feeble, and showed a marked degree of asymmetry of the brain.

One of the most recent pieces of work in this field is that by Stockard‡ upon guinea-pigs. Out of 24 matings of alcoholized fathers with normal mothers, 14 matings gave early abortions or were negative, 5 matings gave stillborn litters (in all, 8 young), 5 matings gave living litters (in all, 12 young); of the 12 living young [illegible] lied in convulsion soon after birth, and 5 survived. The net [illegible] f these 24 matings, therefore, was 5 surviving offspring, or [illegible] many as might have been expected from a single pairing of [illegible] althy animals, and at the age of two months these 5 survivors were only half the usual size.

Dr. Ed. Bertholet,§ pursuing a similar investigation, but by different means, made a series of microscopical examinations of the testes of 120 men, 80 of whom were notoriously alcoholic. He was able to demonstrate very clear differences between the alcoholics and the non-alcoholics, and says: "The hurtful influence of chronic alcoholism upon sexual glands is not to be denied."

Similar results have been obtained in the case of other toxic agents. Gheorghiu‖ "made an extended inquiry into the health conditions of the parents in a long series of monstrous births occurring in the Paris hospitals, and his statistics show most convincingly that there is a direct relationship between parental tuber-

* Féré, *Comptes Rendus, Société de Biol.*, Paris, vol. lii.

† Quoted by Dr. W. C. Sullivan in "Alcoholism," p. 185, 1906.

‡ Quoted in an address on "A Study in Eugenics," by Professor J. G. Adami, which contains much interesting information on the modification of the germ plasm by the environment (*Lancet*, November 2, 1912).

§ Ed. Bertholet, "On the Atrophy of the Human Testicle under the Influence of Chronic Alcoholism," *Centralblatt für Pathologie u. Pathol. Anatomie*, Band. xx., No. 23, 1909.

‖ Quoted from Professor J. G. Adami, *op. cit.*

culosis, syphilis, and acute infections affecting one or other parent, and these gross examples of maldevelopment." Carrière* inoculated a series of male and female guinea-pigs with the toxins of the tubercle bacillus. In the cases where the male only was inoculated there were 16·6 per cent. of stillbirths, 10 per cent. of deaths under ten days of age, and only 73·3 per cent. of survivals.

Lustig† ascertained that when cocks by a process of slow intoxication with abrin had been rendered immune to ordinary fatal doses of that drug, their offspring showed clear traces of the influence of the paternal poisoning, being few in number, of low vitality, stunted, and often deformed in growth. Similar results were obtained by Watson‡ in the case of guinea-pigs. It may be said that in many of the preceding cases the evil effects were still more marked when both parents had been exposed to the toxic agent; but as the action through the mother may not be wholly germinal but partly environmental, I have given statistics of paternal infection only.

But the germ plasm may be modified by other agencies than poison. Sumner has succeeded in producing important racial alterations in mice by means of temperature: Bordage has done the same with peach-trees, and Tower§ with beetles; whilst Macdougal§ has brought about new varieties of plants as a result of injecting chemical agents into the immature ovaries. Lastly, mention may be made of the recent researches of Professor Franz Boaz,‖ which show that in the descendants of immigrants to America there are gradually produced definite changes of racial type which Boaz considers can only be due to the action of the environment.

In view of these and similar facts which are now forthcoming, it is absurd to contend that the germ plasm is immutable. There is the clearest evidence that it may, and does, undergo modification by the environment, and I have thought it well to refer to this at some length for the reason that the fact is one of great importance in the problem of the causation of that pathological germinal variation which lies at the root of mental deficiency, and which has been alleged to be "spontaneous." I venture to think that, in view of

* Carrière, *Archives de Médecine Experimentale*, No. 12, 1900.
† Lustig, *Centralblatt für Pathologie*, No. 15, 1904.
‡ Watson, *British Medical Journal*, vol. ii., 1905.
§ Publications of the Carnegie Institute, Washington, 1905-6.
‖ F. Boaz, "Changes in the Bodily Form of the Descendants of Immigrants," London, 1912.

this evidence, the *a priori* objections of the biologists fall to the ground. If the ascertained facts do not fit in with the theory, so much the worse for the theory; whilst the arguments adduced to the contrary, chiefly of an *a priori* nature too, cease to have any real weight in the light of the facts which are now known.

I hold that primary amentia is a manifestation of a pathological germinal variation which has been produced by the environment, and that the germinal change is of the nature of a vitiation. That is to say, it consists of an impairment of the intrinsic potentiality for development, which may be widespread and affect the germ cell as a whole, or which may be less extensive and confined to the neuronic determinant. At the beginning, in most instances, the latter is probably the case, and the initial change is but slight. It shows itself merely in a diminished function and durability of the higher, and therefore an increased excitability of the lower, cerebral neurones, and is revealed clinically as neurasthenia, hysteria, migraine, and the milder forms of epilepsy. We may say, in fact, that these states are the first indications of the presence of the psychopathic diathesis. Should the adverse environment continue, or should a person so affected mate with one similarly tainted, then in the next generation the neuronic durability will be further diminished, and the instability accentuated, so that insanity, the graver forms of epilepsy, and early dementia make their appearance. If the process is further continued, the third generation will often be characterized by a tendency to defects of anatomical structure, and there will be a strong probability of one or more of the offspring suffering from amentia. Should this germinal impairment be accompanied by any untoward circumstances during the growth of the embryo, like those presently to be described, this probability will become a tolerable certainty. Degeneracy is here well established, and the well-known stigmata, indicative of an extensive germinal change, are usually abundant. Finally, a condition of gross idiocy appears, with complete sterility, and the family becomes extinct.

It is not suggested that the three grades of mental disease above described are necessarily restricted to three successive generations. All the degrees may exist, and frequently do, amongst members of one and the same generation, and I think this result is largely dependent upon the conditions of intra- or early extra-uterine life. Neither do I wish to infer that the neuropathic heritage always

culminates in amentia in the third generation. It may be so modified by admixture with healthy plasm that this end may be much longer delayed; indeed, it may possibly be eradicated in some instances. On the other hand, it occasionally happens that the initial change is so severe that it results at once in gross idiocy. This, however, is exceptional, and from a close study of a very large number of family histories I am disposed to think that, on the whole, the above outline is a tolerably accurate picture of the successive steps in the production of amentia. We may therefore say that this latter condition represents the final manifestation of a progressive psychopathic diathesis.

Thus, in persons suffering from migraine, neurasthenia, and hysteria, it is uncommon to find marked ancestral nervous or psychic disorder; whilst a history of the parents suffering from alcoholism, phthisis, and modes of life attended with severe stress and strain is frequent. In the next grade—the milder forms of epilepsy—neuropathic inheritance becomes more marked, and in the severe forms of this affection it is present, according to Sir William Gowers, in about 35 per cent. of cases. In the next grade—insanity—Sir Thomas Clouston and Dr. J. S. Bolton have found neuropathic inheritance in from 50 to 60 per cent. of cases, whilst in amentia, as I shall presently show, it occurs in 80 per cent. of cases.

The fact that the mating of two persons with pronounced neuropathic inheritance is often followed by an accentuation in degree and earlier appearance in time (ante-dating) of the abnormality in the offspring, has long been recognized clinically by psychiatrists, and has been well shown by such authorities as Sir T. S. Clouston and Sir George Savage. In this connexion the words of the former, in his recent most interesting work on "Unsoundness of Mind," are well worth quoting. Sir T. S. Clouston* says: "I have traced the same series of hereditary morbid sequences through the stages of mental hyperactivity, hyperæsthesia, diminished inhibition, instability, melancholia, mania, alternation, insanity, secondary dementia, down to idiocy, each of these appearing in each successive generation." It may also be mentioned that fifty years ago Morel,† the great French author on the subject of degeneracy, came to the conclusion that the initial stages of the psychopathic diathesis were manifest as a tendency to neurasthenia, mild neuroses and psychoses,

* T. S. Clouston, "Unsoundness of Mind," 1911.

† B. A. Morel, "Traité des Dégénérescences," Paris, 1857.

and peculiarities of conduct and behaviour, and he laid down very clearly that these might be produced by the action of the environment. His work is one of very great interest, and well worth study.

With regard to *all* those adverse conditions of the environment which are responsible for this germinal variation, our knowledge is still very incomplete. It is likely that factors have acted, and may still be at work, of which at present we know nothing, and that many forms of excess, intoxications and auto-intoxications consequent on faulty modes of life, may be capable of impairing the vitality of the germ plasm, and so initiating that early change which, if unchecked, will culminate in amentia. But the close association which exists between the neuropathic diathesis and alcoholism and tuberculosis, together with the experimental work which has been conducted regarding these agencies, leads me to the opinion that they, at any rate, have an important influence.

It would be of extreme value could we ascertain the precise *modus operandi* of these deleterious agencies. Do they act by depriving the neuronic determinant of certain essential food constituents, or have they a direct toxic effect? Perhaps the action is different in different circumstances, but it would appear that the term "blastophoria" (germ corruption) made use of by Forel is not inappropriate. In view of the fact that in man the nervous system is at once the most highly developed, most complex, and most recently evolved, it is not surprising that it should be the most vulnerable to these changes.

The Transmission of the Germinal Defect.

The question now arises, What are the laws governing the transmission of this germinal defect? Since the rediscovery of the work of Gregor Mendel, many inquiries have been made with the object of determining whether hereditary abnormalities and defects in man are transmissible in accordance with Mendel's laws. In the case of some abnormalities, such as brachydactyly, colour-blindness, congenital cataract, night-blindness, etc.,* there is strong reason for thinking that they are so transmitted. Is this the case with the neuropathic diathesis?

* For further information on this subject see the valuable work of Dr. Nettleship, Bowman Lecture, Transactions of the Ophthalmic Society, 1909; Professor Bateson on "Mendel's Principles of Heredity," 1909; and Professor Punnett on "Mendelism," 1907.

One of the most recent pieces of work on this subject is that of Rosanoff and Orr,* of America. The authors conclude a very interesting paper, which is illustrated with a number of family pedigree charts, with the words: "It would seem, then, that the fact of the hereditary transmission of the neuropathic constitution as a recessive trait, in accordance with the Mendelian theory, may be regarded as definitely established." A similar conclusion was arrived at by Davenport and Weeks† in a very careful study of pedigrees of the inmates of the New Jersey State village for epileptics. But the difficulties and sources of possible fallacy attendant upon such inquiries are so great that one must accept these conclusions with considerable reserve. In the first place man is not a very suitable subject for the study of Mendelism at all, owing to the small number of his offspring; added to which so many of the manifestations of the neuropathic diathesis depend upon the nature of the early education, the physical health, and the conditions and mode of life pursued by the individual, that the precise enumeration of those who are, or are not, affected with hereditary taint is exceedingly difficult. An individual may be the victim of the neuropathic diathesis, and yet pass through life apparently normal owing to the absence of the necessary excitant. And a numerical estimate is essential to determine whether this transmission is or is not Mendelian. I am disposed to think, therefore, that many more inquiries will have to be made before these conclusions can be regarded as "established." The utmost we can do at present is to take note of facts, leaving the enunciation of laws until such time as a sufficient array of facts is available. The following are the facts which have come within my own experience with regard to this transmission:

Firstly, that if both parents are healthy and free from neuropathic taint, their offspring is healthy.

Secondly, that if one or both parents, although free from neuropathic inheritance, suffer from alcoholism, severe tuberculosis, plumbism (and possibly other poisons), the nervous system of the offspring tends to be more unstable and less durable than that of the offspring of healthy parentage.

Thirdly, that the mating of such neurotic offspring with healthy

* A. J. Rosanoff and Florence J. Orr, "A Study of Heredity in Insanity in the Light of the Mendelian Theory," No. 5 Bulletin, *Eugenics Record* Office, New York, 1911.

† C. B. Davenport and D. F. Weeks, No. 4 Bulletin, *Eugenics Record* Office. New York, 1911.

and untainted individuals may, after a few generations, eradicate the nervous abnormality, but that the mating with individuals of like constitution tends to produce offspring with an accentuation of the abnormality, and an increased predisposition to more serious neuropathic manifestations.

Fourthly, that the mating of two individuals of such marked neuropathic inheritance yields offspring in whom there is a definite tendency to imperfection of brain development, or mental defect.

Fifthly, that the mating of two mentally defective individuals yields offspring who are all defective.

Amentia directly due to External Causes.

Hitherto I have dealt with *primary* amentia only—that is, with that form which is innate and due to germinal impairment. It is now necessary to say a few words regarding that small proportion of cases of *secondary* amentia in which the germ plasm is healthy, but in which the growth of the brain has been arrested by some external factor acting after conception has taken place. Such condition is a somatic modification.

It has been stated that, although adverse conditions of the environment are present in a considerable number of cases of amentia, the proportion in which they are the direct and sole cause is relatively small—probably at the most not more than 10 to 15 per cent. To this extent, however, the environment does seem capable of producing amentia, although in many instances this is but the incidental phase of a process which is really degenerative and of which the end is dementia. These factors will be described in detail presently, and since many of them are pathological processes which result in a gross lesion of the brain, it will be more convenient to describe the manner of their action together with their clinical characteristics. A few, however, give rise to a general arrest of development without any naked-eye lesion, and these may briefly be referred to in this place.

Under normal conditions the brain of the child grows with extreme rapidity during the first few years of life. This is in consequence of its inherent capacity for growth plus the stimulation of sensory impressions and the presence of an adequate quantity and quality of blood. This inherent capacity may be normal, but the necessary stimulation or food so deficient that the gradual unfold-

ing of the mental faculties does not take place, or takes place so tardily that some degree of backwardness is the result. Cases of this kind, in which development is delayed, are extremely common, and it usually happens that upon the removal of the cause mental expansion rapidly ensues. Should the adverse conditions continue sufficiently long, however, the brain cells seem in some cases unable to recover; the mind never makes up the lost ground, and some degree of mental deficiency is the result. In my experience actual idiocy is never caused in this way, and the resulting defect is of comparatively mild degree only; it is nevertheless a true amentia. I do not think that cases of this kind are very common, but they form a certain small percentage of the adult feeble-minded and of mentally defective school-children, particularly in the large towns. The cause seems usually to be that combination of factors—drink, dirt, and depravity—which go to make up slum life in its worst form.

With regard to the influence of slum life and all its associated conditions in producing amentia, it is necessary to sound a note of warning. It does happen sometimes that the real mental defectives of our large towns hail from the slums, although I do not think such is disproportionately the case. Still, a sufficient number of defective children come from such areas to make the superficial inquirer, content with that which is apparent, jump to the conclusion that the pernicious environment is therefore the cause of their defect. My own inquiries have convinced me that in the great majority of these slum cases there is a pronounced morbid inheritance, and that their environment is not the cause, but the *result*, of that heredity. The neuropath is one who is at an economic disadvantage in the struggle for existence. He frequently finds it difficult to hold his place, and he is often possessed of careless, improvident, and intemperate propensities, which cause him to fritter away the money he does earn. He is on the downgrade. No wonder, then, that he drifts to the slums.

The Causal Factors of Amentia.

Having now dealt with the production of amentia from a general standpoint, I propose to refer to the individual factors which have a causal relationship to this condition. It will be obvious that most of these are really factors of the environment; nevertheless

their effect is very different. Some of them are operative upon the germ plasm, giving rise to pathological variations, which are transmissible in accordance with the laws of heredity, so that the defect becomes innate. Others only affect the offspring after fertilization has taken place; their effects are therefore of the nature of somatic modifications and are probably not transmissible. For these reasons it will be convenient to divide these etiological factors into two groups, as follows:

A. Germ Variation.

FACTORS INDICATIVE OF, OR PRODUCING, A VARIATION OF THE GERM PLASM.

1. Neuropathic inheritance.
2. Alcoholism.
3. Tuberculosis.
4. Syphilis.
5. Consanguinity.
6. Age of parents.

B. Somatic Modification.

FACTORS ACTING DIRECTLY UPON THE OFFSPRING.

(*a*) *Before Birth*
1. Abnormal conditions of the *Mother* during Pregnancy—(1) Mental, (2) Physical.
2. Injuries, etc., to the *Fœtus*.

(*b*) *During Birth*
1. Abnormalities of Labour.
2. Primogeniture.
3. Premature Birth.

(*c*) *After Birth*
1. Traumatic.
2. Toxic.
3. Convulsive.
4. Nutritional.

FACTORS INDICATIVE OF, OR PRODUCING, GERMINAL VARIATION.

1. *Neuropathic Inheritance.*

It is agreed by all who have studied this question that the most frequent *proximate* cause of amentia is the neuropathic diathesis. As I have already explained, this may be produced by many factors, all of which will be considered in this section. In the present instance, however, I am alluding to those cases in which, however produced, it already exists in the family, as shown by the repeated occurrence of such neuropathological states as amentia, insanity, dementia, epilepsy, paralysis, or various neuroses. My inquiries

showed that, in a series of over 200 patients whose family histories were thoroughly investigated, over 80 per cent. were the descendants of a pronounced neuropathic stock. In 64·5 per cent. the ancestral conditions took the form of amentia, insanity, or epilepsy; whilst in 18 per cent. they consisted in a marked family tendency to paralysis, cerebral hæmorrhages, or various neuroses and psychoses. Somewhat similar results, showing the great prevalence of this factor, have been obtained by other investigators. For instance, in *England* it was found by Beach and Shuttleworth* that insanity, epilepsy, and allied neuroses were well marked in the ancestors of 24 per cent. of the patients they examined; but Dr Caldecott considers that 70 to 75 per cent. have neuropathic antecedents. Dr. Lapage† found that 48·4 per cent. of feeble-minded children in the Manchester special schools had a neuropathic inheritance, and he states that had it been possible to obtain all details, this percentage would probably have been increased. Dr. W. A. Potts‡ ascertained the presence of such inheritance in 45·6 per cent. of children attending the Birmingham special schools, and Dr. Henry Ashby found it to occur in 75 per cent. of his cases. In *America* a Commission appointed by the Legislature of Connecticut found neuropathic heredity to be the undoubted cause in 43 per cent. But Dr. Goddard, of Vineland, as the result of careful personal inquiries, found heredity present in 65 per cent. of cases. In *Germany* Koch§ came to the conclusion that it accounted for 60 per cent. of cases. In *Switzerland* (Canton of Berne) the census of 1893 showed that heredity was present in 55 per cent. of idiots; whilst in *Norway* Ludwig Dahl found it to occur in 50 per cent. of cases.

It is seen that my own results are considerably higher than those obtained by most other observers, and it is necessary to explain the discrepancy. I believe it to be entirely a question of the method adopted. Most statistics relating to this subject have been compiled from case-books or official returns, and although by this means an immense amount of material is available, the data must necessarily be lacking in the accuracy and completeness obtainable by a personal inquiry. Again and again I have di-

* Beach and Shuttleworth, Clifford Allbutt's "System of Medicine," vol. vii.

† C. P. Lapage, "Feeble-mindedness in Children," 1911.

‡ W. A. Potts, *British Journal of Children's Diseases*, March, 1906.

§ J. L. A. Koch, "Zur Statistik der Geisteskrankheiten in Württemberg und der Geisterkr. überhaupt," Stuttgart, 1878.

covered, by a little questioning, a well-marked history of insanity of which no record whatever existed in the case-book; and it is my opinion that, although statistics from these may be of value as showing the *relative* importance of the different factors, they are practically valueless as an indication of the precise extent to which these factors occur.

It was the recognition of the incomplete and unsatisfactory details in the case-books, including those of those which have formed the basis for previous generalizations on this matter, which decided me to conduct an independent and personal inquiry into the causation of amentia. Unfortunately the taking of a reliable family history involves much time and trouble. It is essential to gain the confidence of the relatives, and it is often necessary to interview several members of the family before all the requisite details can be elicited. Moreover, family histories can only be considered satisfactory when they include particulars of three generations. For these reasons a personal inquiry of this kind can only be based upon a comparatively small number of cases; but what is lost in quantity is more than compensated for by accuracy and wealth of detail. As a matter of fact, although I have had access to several thousands of cases, in only a little over 200 were the details sufficiently complete to be of use.

It is very interesting to note that this method has recently been adopted in America with conspicuous success. The Eugenics Section of the American Breeders' Association* have now a regular staff of specially trained and qualified "field workers," and the bulletins issued from their record office already bear much promise of important sociological results. The same method has been pursued by Dr. Henry H. Goddard,† Superintendent of the Vineland State Institution at New Jersey, who has by this means been able to collect most valuable pedigrees of the mentally defective; also by Dr. Henry A. Cotton,‡ Medical Director of the New Jersey State Hospital of Trenton, who has now collected a large number of pedigrees, giving particulars, on an average, of 200 or more individuals in each family. In Germany inquiries on similar lines

* See Bulletins issued from *Eugenics Record* Office, Cold Spring Harbour, New York.

† See an article by Dr. H. H. Goddard on "Heredity of Feeble-mindedness," *American Breeders' Magazine*, vol. i., No. 3.

‡ H. A. Cotton, "Problems in Study of Heredity in Mental Disease," *American Journal of Insanity*, July, 1912.

are being conducted by the indefatigable Dr. E. Rüdin,* Oberarzt of the Royal Psychiatric Klinic in Munich, who personally goes into the field for several months each year to collect data.

With regard to my own cases, the following additional facts may be cited: Of 124 patients with neuropathic heredity, it was present in the direct line only in 58; in the collaterals only in 26; and in *both* direct and collaterals in 40 cases. It was present on the paternal side only in 61; on the maternal only in 39; and on *both* sides in 24 cases.

It is seen from these latter figures that paternal is more common than maternal inheritance. Voisin found the reverse to be the case. It is therefore probable that a sufficiently large series of cases would show that there was little difference in this respect. In my cases the transmission occurred equally to the same and to the opposite sex.

It would, of course, be desirable that these statistics should be compared with similar ones regarding the mentally normal population. This has recently been done by Dr. Ettie Sayer,† who found that in the families of 100 mentally defective children there was a family history of insanity in 31, of epilepsy in 11, and that a parent was mentally defective in 34 cases; as against a family history of insanity in 7, of epilepsy in 6, and a parent mentally defective in 2 cases of 100 normal children.

For several years past I have been gathering details from hospital and private patients, and I am fully satisfied that the extent of neuropathic inheritance is quite insignificant in the mentally normal as compared with the defective population. Instances of a solitary ancestor being epileptic or insane are not rare, but it is decidedly exceptional to find definite and pronounced neuropathic heredity, such as occurs in the families upon which my statistics are based, in an individual of normal bodily and mental development.

2. *Alcoholism.*

The factor which occurs next in frequency is alcoholism—a pronounced family history of which was present in no less than 46·5 per cent. of my cases. It is to be remarked, however, that in five-sixths of these there was a definite neuropathic predisposition also,

* E. Rüdin, "Wege und Ziele Familien Forschung," etc., *Zeitschrift für die gesammte Neurol. u. Psychiatrie*, November 18, 1911.

† E. Sayer, *Eugenics Review*, July, 1913.

whilst in most of the remainder there was a history of other morbid influences.

It is necessary to point out that alcohol may act in two ways. I have already adduced facts showing that it may undoubtedly so impair the germ plasm as to cause pathological variation; but it may also have a direct effect upon the embryo after fertilization has taken place. As is well known, the ingestion of alcohol is rapidly followed by its appearance in the blood, and since it has been conclusively shown by numerous experiments that alcohol has a most baneful effect upon growing protoplasm, it follows that the systematic abuse of alcohol by a pregnant woman may be attended with decidedly injurious consequences to the offspring. In dealing with alcoholism, therefore—and the same applies to such other toxic agencies as tuberculosis, syphilis, lead, etc.—unless the father alone has been affected it is not always possible to say whether the effect is upon the germ plasm or upon the growing embryo, probably both, hence both these modes of action will be considered in this place.

The following statistics may be quoted as showing the extent to which a history of alcoholism has been found in the families of aments by other inquirers. Beach and Shuttleworth in 16·3 per cent. of cases, Kerlin (Philadelphia) in 38 per cent., Howe (America) in over 25 per cent. of idiots found that the parents were habitual drunkards; Looft (Norway) in 3·7 per cent., and Kind (Hanover) in 11 per cent. Potts found that 41·6 per cent. of mentally defective children in Birmingham had alcoholic antecedents.

The great discrepancy existing between these figures, together with the fact that a history of alcoholism is usually accompanied by a definite history of insanity, epilepsy, or other neuropathic condition, suggests that its action is more often contributory than directly causal. It is also necessary to point out that alcoholism may be, and often is, an indication of existing nervous weakness, and this being the case the extent to which it is found may be dependent upon the facilities with which alcohol is obtainable in different situations. It is also necessary to remember that "alcoholism" is a vague term, and may mean very different things with different observers.

I think there is now conclusive evidence that either paternal or maternal alcoholism may, in the absence of any other factor, produce mental defect; but in my experience such a result is not

common in this country, and its chief action seems to me to lie either in giving rise to that initial impairment of the germ plasm which may be the forerunner of amentia, or in accentuating a neuropathic diathesis which already exists.

The subject is a very large one, and there can be no doubt that many exaggerated statements have been made regarding it by biassed persons. At the same time it is one of such importance that it is necessary to refer to a few facts in confirmation of the above statements.

The following case, which came under my own observation, is an illustration of alcohol being the direct cause of amentia. The father was a hard-working, industrious man, sound in body and mind, and coming of a healthy and long-lived family; he married the daughter of a small publican, apparently a healthy and happy girl, who used occasionally to serve behind the bar. Shortly after marriage this girl developed an insatiable craving for drink; all the money she could obtain by any pretence whatever went in procuring it. Later the ornaments and then the furniture of the house were pawned to feed her desires; ten months after marriage she gave birth to a child—a hydrocephalic idiot, and according to the husband, she had scarcely known a sober moment during the preceding four or five months. Further inquiry showed that this woman's father was also a heavy drinker, but otherwise there was an entire absence of any neuropathic condition in the family. Of course it may be that the alcoholic taste of the mother was in itself evidence of the neuropathic diathesis, but I cannot help thinking that the child's condition was more largely due to an actual poisoning during its intra-uterine existence, and this view seems to be supported by the subsequent history, for the next child that was born, after an interval of nearly two years, was perfectly normal, and is now a bright and intelligent boy of eight years; by this time, however, the mother had recovered, and had lived a perfectly steady life during the whole of the pregnancy. It may be mentioned that Galton* described the case of a man, who, after begetting several normal children, became a drunkard and had imbecile offspring.

Several writers have described cases of mental defect which have been due to one or both parents being intoxicated at the moment of conception, and Langdon Down, Sabatier, Quatrefages, Lucon, Morel, Bourneville, and others are of opinion that idiocy is a com-

* Quoted by Sullivan in "Alcoholism."

mon sequence of such a condition. Thus Sabatier* mentions, amongst many similar instances, that of a robust and intelligent peasant of Auvergne who, following the custom prevailing in many villages of his district, passed the first three weeks of his married life in drinking and jollification, being in a state of moderate alcoholic intoxication all the time. Nine and a half months later his wife gave birth to an imbecile girl, who was unable to learn to read or write. Demeaux, also Dehaut and Voisin, have traced cases of epilepsy to alcoholic intoxication of the parents at the time of conception. Grenier, studying 188 idiot and imbecile children, found that in 7 the condition was due to drunkenness of the parents during the first few days of married life.

On the other hand, it is stated by Dr. Ireland† that in some parts of Scotland whole villages of the lower classes get drunk at New Year time, and that the same is also the case with the herring fishermen when they return to port; but it has never been noticed that the resulting children were idiotic. Personally I have histories of idiots conceived under such circumstances, but so I have of normal children, and on the whole I am of the same opinion as Näcke,‡ that whilst such a result may certainly be possible, it only occurs with extreme rarity.

With regard to the influence of alcohol in bringing about less pronounced neuropathic conditions, there is the clearest evidence, to some of which reference has already been made. Thus Dr. Wiglesworth,§ after many years' study which embraced 3,450 cases of insanity, says there is "a direct poisoning of the germ plasm itself by the alcohol circulating in the blood, and a consequent direct injury to the cells of which this structure is composed, and which by reason of the injury are prevented from developing into a stable organism. If the alcoholic poisoning of the germ cells and ovum has reached a certain degree of intensity, imbecility, or even profound idiocy, may be expected to result; while if of a less degree, the injury may manifest itself in the various forms of adolescent insanity, when adult life is developing, or has been attained to." His conclusion is that alcoholism in the progenitors is a fruitful cause of idiocy, mental defect, insanity, and other nervous diseases in the offspring.

* Quoted by W. L. Andriezen in "The Problem of Heredity."
† W. W. Ireland, "Mental Affections of Children," 1898.
‡ P. Näcke, "*Die Zeugung im Rausche*," *Neurolog. Centralbl.*, No. 2, 1908.
§ Wiglesworth, *Journal of Mental Science*, October, 1902.

Dr. W. C. Sullivan* conducted an inquiry regarding the children of 120 women who were habitual drinkers, excluding all those who had a phthisical, syphilitic, or neuropathic taint, with the following results: "335 (55·8 per cent.) died in infancy or were stillborn. Several of the survivors were mentally defective and as many as 4·1 per cent. were epileptic. (The proportion of epileptics in the general population is 0·1 per cent.) Many of these women had female relatives, sisters or daughters, of sober habits, and married to sober husbands; on comparing the death-rate amongst the children of the sober mothers with those amongst the drunken mothers of the same stock, the former was found to be 23·9 per cent., the latter 55·2 per cent., or nearly two and a half times as much. It was further observed that in the drunken families there was a progressive rise in the death-rate from the earlier to the later born children. . . . In one observation where the first three children were healthy, the fourth was of defective intelligence, the fifth was an epileptic idiot, the sixth was dead-born, and finally the reproductive career ended with an abortion."

Professor G. von Bunge,† as the result of an extensive inquiry, comes to the conclusion that tuberculosis and nervous and mental diseases are far more prevalent in the descendants of drunkards than in those of abstainers. His figures show that there is a direct relation between the extent to which these diseases occur and the degree to which the parent has been addicted to alcohol.

An extensive inquiry conducted under the auspices of Dr. T. Crothers,‡ of Connecticut, U.S.A., by a number of skilled physicians and specialists, and which was based on the study of 1,744 cases of inebriety, showed that the injury produced by the alcoholism of parents not only affected the nervous system of the immediate progeny, but that the ill-effects were also transmitted through them to the later progeny of the third generation either as a neurosis or a cerebral defect.

Such evidence§ might be multiplied almost *ad nauseam ;* but the

* W. C. Sullivan, "Alcoholism."

† G. von Bunge, "Les Sources de Dégénérescence," 1910.

‡ Crothers, *Quarterly Journal of Inebriety*, January, 1901.

§ For further particulars consult Horsley and Sturge, "Alcohol and the Human Body," 1907; a very interesting paper on "The Problem of Heredity," by Dr. W. L. Andriezen, *Journal of Mental Science*, January, 1905; a comprehensive article by Dr. W. A. Potts on "The Relation of Alcohol to Feeble-mindedness," with discussion thereon, in *British Journal of Inebriety*, January 1909; and Dr. W. C. Sullivan's valuable work on "Alcoholism," 1906.

above is sufficient to show the important influence exerted by alcoholism in the production of mental defect.

3. *Tuberculosis.*

I believe that ancestral tuberculosis is but rarely the direct and sole cause of amentia; but my observations show that, like alcoholism, it has an important indirect, and possibly also a contributory, influence. This indirect effect is seen in its potency to produce the milder and initial forms of nervous instability in the offspring, such as migraine, hysteria, and neurasthenia, a clinical fact which has been frequently noticed.

Dr. T. D. Savill* states that persons suffering from neurasthenia are often the children of alcoholic and tuberculous parents, but that a history of hereditary insanity is not common. "For some reason which does not appear on the surface, I find among my cases quite a number whose family history shows no nervous ailments, but tuberculosis on one or both sides."

With regard to persons suffering from amentia, I found a pronounced tendency to tubercular lesions in the families of 34 per cent. of cases investigated. Beach and Shuttleworth found this factor in close on 30 per cent., Langdon Down in 22·5 per cent., and Kerlin in 56 per cent. of cases. Potts found that tubercular antecedents occurred in 43·2 per cent. of defective, as compared with 17 per cent. of normal, children. It is to be noted, however, that a history of antecedent tuberculosis rarely occurs alone; in four-fifths of my own cases it was accompanied by a definite neuropathic inheritance, whilst in the remaining fifth other conditions—usually alcoholism—were also present.

There can be no doubt that the death-rate from tuberculosis is very much higher (nearly four times as much) in the case of aments than it is in the non-defective population. This applies in a somewhat less degree to neuropaths generally; but whether it is the result of special predisposition to this disease, or whether it is simply a consequence of their general want of resistance and feeble vitality, I do not know.

4. *Syphilis.*

The investigation of family histories would lead to the conclusion that syphilis was not a frequent cause of amentia. Fletcher Beach

* T. D. Savill, "Lectures on Neurasthenia," 1908.

found it present in but 1·17 per cent. of the 2,400 pauper aments he examined from the London area. Langdon Down and Shuttleworth found it in about 2 per cent., and Potts in 4 per cent., of cases; whilst in my own series only 2·5 per cent. of the patients examined presented undoubted marks of this disease. But the history in such cases is notoriously misleading; further, not only may the characteristic lesions be so slight as easily to escape detection, but it is now an established fact that they may be absent altogether, and yet the individual suffer from the syphilitic virus. During the past few years I have seen several cases of amentia of the ordinary simple variety in which the closest examination failed to reveal any syphilitic lesions, and yet there was not only a well-marked history of paternal and maternal infection, but both elder and younger members of the family showed typical lesions.

Under these circumstances one would expect that the Wassermann reaction would supply us with far more reliable evidence of the presence of syphilis than would an investigation of the family history or a minute inspection of the patient, and this has now been applied to a very considerable number of patients. Whether it is that there are great differences in the clinical material used, or variations in the technique of applying the reaction, or real differences in the incidence of syphilis, I do not know; but it is certainly a fact that the results of different workers vary in the most marked manner. Thus, in France, Raviart* and others obtained a positive reaction in 30 per cent. of cases. In Germany, Kröber† in 21 per cent.; but Kellner‡ and others in only 3·7 per cent.; and Thomsen§ and others in only 1·5 per cent. In America, Attwood‖ in 15 per cent. of cases. In England, Dean¶ in 15·4 per cent., Thomas** in 4·8 per cent., and Gordon†† in 16·5 per cent.

The most recent results are those of Dr. Gordon,†† which are based upon the examination of 400 patients suffering from various forms of congenital mental deficiency in the asylums of the Metropolitan Asylums Board. Dr. Gordon has analyzed his results according to

* Raviart and others, *Revue de Médecine*, Paris, vol. xxviii. No. 9. 1909.
† Kröber, *Medicin Klinik*, Vienna, Band vii., 1911.
‡ Kellner and others, *Deutsch. Med. Wochenschrift*, Berlin, vol. xxxv., Oct., 1909.
§ Thomsen and others, *Berlin. Klin. Woch.*, Band xlviii., 1911.
‖ Attwood, *Journal of American Medical Association*, Chicago, vol. lv., 1911.
¶ Dean, *Lancet*, July 23, 1910.
** Thomas, Report of Lunacy Commissioners, 1913.
†† Gordon, *Lancet*, September 20, 1913.

various clinical conditions present, from which it appears that, whilst the reaction was positive in 13·3 per cent. of non-epileptic patients, it occurred in 21·5 per cent. of those who were subject to epilepsy. Similarly, it occurred in 11·2 per cent. of non-plegic cases, but in 31·4 per cent. of those suffering from some form of paralysis. A reaction was obtained in 11·9 per cent. of patients of the simple variety of amentia without paralysis, but in 31·8 per cent. of this variety complicated by paralysis. And it seems probable that, if a positive reaction be accepted as conclusive evidence of syphilis, the incidence of this is even greater than that revealed by these figures, for there were several patients in whom the reaction was negative who yet presented definite lesions which have long been recognized as syphilitic.

As to the mode of action of this agent, I think there is no doubt that syphilis is capable of producing an impairment of the germ cell, in consequence of which a condition of primary amentia results, which is probably indistinguishable from primary amentia in general, or which may possess hitherto unrecognized particular features. On the other hand, the poison may act upon the embryo after fertilization; the child, in fact, is directly infected by the mother, and suffers from "congenital" (erroneously termed "inherited") syphilis, and it is in these cases that Wassermann's reaction would be more likely to yield a positive result. The fact that, in many cases of infection, the neuronic arrest and degeneration present histological features different from the ordinary syphilitic lesions led Fournier* and others to conclude that, although they were a consequence of syphilis, they were not actually syphilitic, and to designate them "parasyphilitic"; but the recent work of McIntosh and Fildes† affords strong reason for thinking that such conditions do not differ in any way etiologically from other syphilitic diseases of the central nervous system.

There is no doubt that by either of these modes syphilis, acting alone, can produce mental defect, and I have seen several cases in which the most searching inquiry failed to reveal evidence of neuropathic predisposition or any other adverse factor whatever. At the same time, I am inclined to think that the proportion of cases so arising is relatively small, and in the majority of patients in

* Fournier, "Les Affections Parasyphilitiques," 1894.

† McIntosh and Fildes, "The Pathology of the Condition known as 'Parasyphilis,'" *Lancet*, September 27, 1913.

whom syphilis is present other factors will be found in addition, generally a neuropathic inheritance. It is necessary to remember that a child may suffer from congenital syphilis, and yet show no mental impairment; at the same time, a considerable number of such individuals do often manifest peculiarities of mind at a later age. I am disposed to think that the result is largely influenced by the presence or absence of neuropathic taint. The syphilitic poison seems to have a predilection for finding out the weak spot, and if a predisposition to nervous weakness exists, the chance of the child of syphilitic parents being mentally deficient seems to me to be very considerable; in the absence of such, it may probably escape.

5. *Consanguinity.*

It is the general opinion that the intermarriage of blood relations is fraught with considerable evil effects, both mental and physical, to the offspring. That this is the case in certain of the domesticated animals there seems to be no doubt, and practically all breeders of experience are unanimous that injury is almost certain to result from repeated "in-breeding." The effects upon the offspring are—The nervous system is rendered more unstable, and therefore more excitable; any existing constitutional defects are intensified; the size tends to decrease; and there is produced a predisposition to disease and an impairment of the reproductive functions. In other words, the result is a deterioration, and of exactly the same nature as that deterioration which takes place in the human being, the final expression of which is—idiocy. If, therefore, we can argue from the lower animals to man in this respect, consanguinity is undoubtedly harmful.

In the case of man, in-breeding to this extent is practically unknown; but instances are not wanting in which intermarriage has taken place for many generations without the slightest untoward result. Thus, Voisin,* who investigated the offspring of forty-six consanguineous marriages in the commune of Batz, where intermarrying had been the rule for several generations, says that "insanity, idiocy, and deaf-mutism are unknown"; and the same author could not find consanguinity the cause of mental deficiency in a single case at the Bicêtre and Salpêtrière. Huth† also is of

* Jules Voisin, "L'Idiotie," Paris, 1893.
† Alfred Huth, "Marriage of Near Kin," London, 1875.

opinion that this practice is not attended with harm if the family is healthy, and instances the inhabitants of Pitcairn and Iceland in support of his statement. George Darwin* arrived at a similar conclusion.

The Jews and Quakers are well-known instances of modified intermarrying. With regard to the Jews, there can be no doubt that whilst many of them evince a very high degree of intellectual and artistic ability, yet as a race they are exceedingly neurotic and prone to insanity.

Still, it must not be too readily assumed that consanguinity is necessarily responsible for all this. When one recalls the wretched conditions under which the Jews have been compelled to live for at least the past 2.000 years, from which, indeed, even now they are in many places not free, and when one thinks of the constant harrying to which they have all this time been subjected, it is not improbable that other factors than consanguinity may have left their mark upon the nervous system of the Jew.

As to the Quakers, I have been unable to obtain any actual figures, but I have been assured by several people who have an intimate knowledge of them, that the pure Quakers are rapidly becoming extinct, and that insanity is very rife amongst them.

The crux of the whole question is the presence of morbid inheritance, not of consanguinity, and I believe the result to be entirely dependent upon the presence or absence of a constitutional taint. Should such be present, it will, of course, tend to be accentuated, and the effect upon the offspring may be disastrous. In its absence, however, I doubt whether any untoward result is likely to follow, and I certainly do not think that amentia will arise. As a matter of fact, a considerable amount of intermarrying still takes place in certain localities of our own country, such, for instance, as inaccessible islands in the north of Scotland and out-of-the-way rural districts; but I know of no statistics showing that in these cases it has been responsible *per se* for the occurrence of mental deficiency. At the same time there are many biological objections to the practice, and it is not one to be advocated.

In my opinion, therefore, the statement that consanguinity is, in itself, an important cause of amentia is one not supported by facts. In my own series of cases I found that only 5 per cent. of defectives were the offspring of blood relations, and in all of these

* G. Darwin, *Journal of the Statistical Society*, June, 1875.

a pronounced neuropathic heredity was present. A similarly small percentage is revealed by several other inquirers. Thus Beach and Shuttleworth found consanguinity in 4·2 per cent., Down in 7 per cent., Kerlin in 7 per cent., and, in fact, the result of careful research is decidedly to discount this factor as a cause of amentia. Langdon Down, indeed, says: "I am by no means sure that by a *judicious* selection of cousins the race might not be improved."

Dr. Gillet,* of Paris, came to the conclusion that consanguinity played a most important part in the production of idiocy, and at first sight his statistics seem fully to bear out his contention; but on a closer examination it is evident that he has completely ignored the question of the mental or physical condition of the ancestors, and simply taken note of the presence or absence of blood relationship.

6. *Age of Parents.*

There are reasons for thinking that the age of the parents at conception is not without influence upon the vitality of the child. Thus Korosi,† as a result of the investigation of 24,000 unselected individuals, came to the conclusion that the children of fathers below twenty and above forty years are weaker than when the fathers are between these ages; also that the children of mothers over forty years of age are weaker than those born when the mother is below this age. Dr. Antonio Marro,‡ Director of the Lunatic Asylum of Turin, after a very extensive series of observations, came to the same conclusion, and considers that both mental and physical stigmata of degeneracy are commoner in children born of parents under the age of twenty-six and over that of forty than in those born between these ages. Matthews Duncan§ was of opinion that premature and late marriages were influential in the production of idiocy, and Langdon Down‖ found that in 23 per cent. of idiots there was a disparity of more than ten years in the ages of the parents. Amongst my own patients a similar disparity existed in 4 per cent. of cases, in all of them the father being the elder. In one case the difference in age was as much as thirty-two years. In

* Gillet, "Thèse de Paris," 1900.

† Korosi, Transactions of the International Congress of Hygiene, London, 1891, vol. x.

‡ A. Marro, "Influence of Age of Parents on Offspring," "Problems in Eugenics," 1912.

§ Matthews Duncan, *Lancet*, January and March, 1885.

‖ Langdon Down, "Notes of One Thousand Cases of Idiocy."

all these families, however, a well-marked neuropathic diathesis was present, and as I have knowledge of several cases in which a similar difference existed without morbid heredity, where the offspring is perfectly healthy, I am of opinion that the influence of such a condition is, in itself, really infinitesimal.

Factors acting directly upon the Offspring.

These factors may most conveniently be referred to under the three headings—*Before*, *During*, and *After Birth*.

Those acting *before birth* are mostly referable to some unhealthy mental or physical condition of the mother during pregnancy, although an actual injury to the fœtus may also occur during this time. *During birth* they chiefly relate to the various abnormalities attending labour, and in this place reference will also be made to primogeniture and premature birth. *After birth* the factors are either traumatic, toxic, convulsive, or some disturbance profoundly influencing nutrition.

There is no doubt that a history of one or other of these factors can be elicited in a considerable number of cases of amentia. In my own series they were present in no less than 65 per cent.; but, as will be shown, the proportion of cases in which they are the sole cause is relatively small, and in the majority of instances their effect is contributory only.

1. *Before Birth.*

1. *Abnormal Condition of the Mother during Pregnancy.*—The abnormal condition of the mother may be either physical or mental. The former may be due to the presence of actual disease or to a state of general enfeeblement independent of any specific illness. The latter embraces worry, sudden shock or fright, and the much-debated question of maternal impressions.

With regard to the *mother's physical condition*, my inquiries show this to have been unsatisfactory in about one-fifth of the cases examined; but since in the great majority there was also a marked history of neuropathic predisposition, it is clear that this factor alone cannot be regarded as a very prevalent direct cause. At the same time I am disposed to think that under certain circumstances its contributory or determining action may be very considerable. It is to be remembered that even where there is no innate germinal weakness, the development of the embryo is still largely dependent

upon the quantity and quality of nutriment it receives through the placental circulation; hence, if the mother is suffering from serious disease or nutritional defect, the growth of the offspring is hardly likely to be up to the normal standard. Where some degree of germinal impairment is present, however, the condition of the mother may suffice to turn the scale from a degree of development compatible with the needs of everyday life to one of mental deficiency. As I have already remarked, it is quite likely that contributory or determining factors of the kind we are now considering explain the occurrence of sporadic cases of idiocy in a family of which the brothers and sisters show no marked mental deterioration.

In a small proportion of cases it seems likely that the presence of serious disease of the mother during gestation may have such an inimical effect upon the development of the child as actually to produce mental defect. Thus, Sir James Crichton-Browne, in his evidence before the Royal Commission, mentions the case of an idiot whose mother, during pregnancy, suffered from an attack of Asiatic cholera; her other children, born before and after the idiot, being perfectly healthy. Dr. Potts mentions a case in which amentia was probably caused by a severe attack of typhus shortly before marriage, and another in which the mental abnormality was due to the mother having typhoid fever at the fifth month. Dr. Heller* describes three aments whose mothers suffered from malaria during gestation.

As further illustrating this point, allusion may be made to the recent researches of Dr. Catola,† of Florence. He examined the spinal cords of infants dying at birth whose mothers had been suffering from chronic disease, and found definite indications of defective development, chiefly in the form of imperfect myelination of certain of the nerve tracts. He concludes that "'different morbid conditions in the maternal parent may be associated with defects of development and slight lesions in the central nervous system of the children, such as may, in the case of the latter surviving, play a certain rôle in the mechanism of morbid predisposition."

Reference may also be made to the researches of Féré already quoted, and to those of Dareste‡ and Windle.§ Dareste produced

* Heller, "Grundriss der Heilpädagogik," 1904.

† Catola, *Revue de Médecine*, September, 1910.

‡ Dareste, "Recherches sur la Production Artificielle des Monstrosities." Paris, 1877.

§ Windle, Proceedings of the Birmingham Philosophical Society, vii., 1890.

various monstrosities by treating fowls' eggs in different ways; Windle corroborated this, and also obtained monstrosities by subjecting eggs to such agencies as electricity and magnetism.

I have already remarked that the presence of maternal alcoholism, tuberculosis, syphilis, and plumbism constitute an adverse environment which may have an important contributory, or occasionally even direct, influence in the production of mental defect. Rennert* states that many of the women employed in the pottery factories of Germany suffer from a form of plumbism, which gives rise to frequent abortions, deaf-mutes, and macrocephalics. The same is probably true also of *ecbolics*. It is stated that the use of these drugs in America is responsible for a considerable number of cases of feeble-mindedness, and Sir James Crichton Browne gives it as his opinion that where abortion "is instrumentally attempted without success, injury may be done to the head of the fœtus, and where drugs are used, these may disastrously interfere with its nutrition and growth."

It must, however, be emphasized that cases of amentia directly resulting from any of these causes are relatively rare, and that in the large majority of defectives such physical conditions of the mother have a contributory influence only.

Illegitimacy has been credited with the causation of amentia. It is no doubt responsible for a very high proportion of infantile deaths,† and statistics show that this is on account of the adverse environment in such cases, but I do not think it is ever in itself a direct cause of mental defect.

The *mental state of the mother during gestation* would appear to be of considerably less importance, as was shown by an inquiry I made into the condition of children born whilst, or shortly after, the mother was insane. This is by no means an uncommon event; in fact, a certain number of children are born every year within lunatic asylums, and I have traced the subsequent history of thirty-eight of these up to periods at which any mental abnormality would have been evident. In fourteen of these women the insanity was of a temporary nature, due solely to nervous breakdown at a trying period, and hereditary predisposition was absent. Out of the fourteen children, *ten were alive and well* in body and mind at ages varying from three to fifteen years, whilst *four were dead*. On the

* Rennert, "American Journal of Obstetrics," October, 1882.

† See Dr. Lankester's report, quoted in Newsholme's "Vital Statistics."

other hand, in twenty-four women, the attack of insanity was accompanied by a pronounced neuropathic inheritance. Out of these children only *three were alive and well*, whilst *twenty-one had succumbed*, all, with one exception, a few months after birth. Owing to the great difficulty of following up such cases, these figures are necessarily small; but I cannot do other than regard them as evidence of the slight effect of the mental state during gestation, and of the important influence of morbid heredity.

With regard to the much-debated question of *maternal impressions*, without entering into this subject in any detail, it can be said that both these and the sudden frights and shocks which are often alleged to be the cause of the patients' condition really have very little influence. So far I have been unable to discover a single case of this nature in which hereditary influences (commonly insanity) were not forthcoming upon a careful inquiry into the antecedents, so that, whilst being unable to deny the possibility of amentia resulting from such conditions, it can certainly be positively affirmed that such instances are exceedingly rare (see footnote on p. 69).

An instance which is sometimes quoted in support of the influence of maternal impressions is the siege of Paris. Legrand du Saulle says: "Out of 92 children born in Paris during the great siege of 1870–71, 64 had mental and physical anomalies, and the remaining 28 were weakly; 21 were imbecile or idiotic, and 8 showed moral or emotional insanity." But may it not be that these effects were the result of the *physical* condition of the mothers during this dreadful time—of the *environment* rather than of any *mental* impression?

2. *Injuries to the Fœtus.*—In a few cases amentia is attributed to an *injury* received during intra-uterine existence, but as these in no way differ from those in which injury is inflicted after birth, it will be better to consider them with the latter group.

2. *During Birth.*

1. *Abnormal Labour.*—It is generally considered that this is a very important and frequent cause of mental deficiency. Beach and Shuttleworth attribute no less than 17·5 per cent. of their cases to such cause, of which 14·2 per cent. were due to protracted labour causing pressure, and 3·3 per cent. to instrumental delivery. It is to be remembered, however, that these statistics were confined to institution cases, and I believe that such are hardly representative of amentia in general.

Where difficulty in parturition causes mental defect, it is because a gross lesion of the brain has been produced; such cases are generally of a severe degree, and consequently tend to gravitate to the special institutions. In corroboration of this I found that a history of these factors was much more common among the severer grades at Darenth Asylum than amongst the patients in the London County asylums; but even in those at Darenth careful inquiries elicited that in the majority pronounced morbid heredity was also present. Out of 18 per cent. of cases in which I obtained a history of abnormal labour, precipitate labour occurred in 2 per cent., protracted labour with asphyxia in 14 per cent., and instrumental delivery in 2 per cent.; but in only one-ninth of these was there no neuropathic predisposition. All of these latter were cases of asphyxia neonatorum, and as they are confirmed epileptics, it is probably largely owing to the convulsions that the mental arrest is due.

I am therefore of opinion that the importance of abnormalities of labour as a cause of amentia has been much overrated, and that the total number of cases which are the immediate consequence of these conditions is relatively very small, being probably not more than 1 or 2 per cent. of all aments. It is true that the parents of the patients are generally quite satisfied with this explanation; they find it much more comforting to believe that the unfortunate child is the victim of some extraneous factor than the product of hereditary taint; but I am convinced that, if careful inquiries are made into the family histories of these cases, pronounced hereditary tendency will be found in a very large proportion. On the other hand, there can be no doubt that where such morbid heredity exists, any difficulty during labour—and especially if attended with asphyxia—will have an important contributory effect; and it is certainly responsible for many of the gross brain lesions, with their resulting paralyses and convulsions, which are so common in the more severe grades. It is to be remarked that abnormal presentations and anomalies of labour are probably of much greater frequency in psychopathic than in mentally sound women, as also with defective than with normal children.

Little,* in an important paper published in the year 1862, was the first in this country to draw attention to mental and physical defects resulting from abnormalities of labour. He collected a series of 63 cases presenting various defects of this kind, the most

* Little, Transactions of the London Obstetrical Society, 1862.

common cause being asphyxia due to protracted delivery; but he himself says: "It is obvious that the great majority of stillborn infants whose lives are saved by the attendant accoucheur recover unharmed from that condition"—a statement which has since been fully endorsed by many eminent obstetricians, and which is confirmed by everyday experience. It is indisputable that in a certain small percentage of cases in which asphyxia or hæmorrhage occurs some degree of paralysis results—indeed, this condition is known as "Little's disease"—also that of the cases so affected a small number may show mental impairment. Out of the 63 cases of lesions collected by Little, however, there were only 11 in which the intellect suffered, 2 of these being actually idiotic, and the remaining 9 suffering from various degrees of feeble-mindedness. In all his cases the patients were seen at an age at which mental impairment would have been noticed had it existed, and in some of those who were physically defective the mental capacity is described as being beyond the average. Unfortunately, Little did not inquire into the family history of his cases, but his paper affords no evidence that amentia is at all a common result of abnormality of labour. In this connexion it may be remarked that it is recorded of Samuel Johnson that "he was born almost dead, and did not cry for some time."

With regard to instrumental delivery, we have only to consider the number of children who are delivered by forceps every day, and the fact that the head of the child is even normally subjected to great pressure in the parturient canal, to arrive at the conclusion that the proper use of the forceps can play no practical part in the production of amentia. It may further be remarked that artificial compression of the child's head after birth has been long practised by several races of people, and is even now still in use in the Toulouse district of France, without any apparent evil effects, and certainly without producing idiocy. Dr. Delisle* says that, although in France the practice is slowly dying out, it still persists to a surprising extent. He finds, however, that it shows no tendency to become hereditarily impressed upon the race, nor is there any sufficient evidence to support the belief that it causes either any arrest of physical or mental development, or any unusual tendency to insanity. Lastly, Spiegelberg† says that "the indentations and

* Delisle, "Artificial Deformity of the Skull," *Bull. Soc. d'Anth. de Paris*, 1902, fasc. 2.

† Spiegelberg, "Textbook of Midwifery."

depressions which result in the cranial bones from pressure have a comparatively unimportant influence on the children."

2. *Primogeniture.*—It is said that first-born children are more liable to be mentally defective than are those born subsequently, and this is attributed partly to a supposed increased mental instability of the mother during a first pregnancy, partly to the undoubted fact that labour is more protracted in primiparæ, and partly to the earlier age of the parents. But it has already been seen that neither the mother's mental state nor protracted labour really have very much influence upon the intellectual status of the child in the absence of neuropathic predisposition, so that any ill-effect resulting from primogeniture is probably attributable to the age of the parents. It has been shown by Professor Pearson, also by Dr. Sören Hansen, that there is a greater incidence of tuberculosis in first-born than in later-born children. Mr. David Heron has shown that this is also the case with insanity, Dr. Goring with regard to criminal tendencies, and Dr. Crzillitzer with regard to myopia. Mdlle. Robinovitch also brings forward some evidence showing that distinguished men are more frequently the last-born members of the family. On the whole, therefore, it certainly appears possible that first-born children suffer from a mental and physical inferiority in comparison with the later members of the family, and this may be a factor in determining amentia where a neuropathic predisposition exists. But that primogeniture, *per se*, is ever the cause of amentia, I do not believe, and, as a matter of fact, the statement that an undue proportion of idiots are first-born children is by no means proved, and can only be settled by a very extensive series of statistics. Certainly my own experience is to the effect that it is more common for the later-born, and not the first-born, to be affected. In those families in which there is a pronounced tendency to mental and physical degeneracy, the effects usually appear to be more and more marked upon each successive child, and often enough the idiot is actually the last born. I have notes of not a few families in which the first one or two children presented no great departure from the normal; these were followed by one or two others who succumbed to ordinary children's ailments, from which healthy children would probably have recovered; then came the idiot, in some cases to be succeeded by a number of stillbirths. It may be noted that this sequence is the direct opposite to that which occurs in syphilitic infection.

3. *Premature Birth.*—Where hereditary predisposition exists, it is probable that the child who is prematurely born will have less chance of attaining complete mental development than will the one who goes to full term; but in the absence of other factors I do not believe that premature birth has any effect upon the resulting mental condition.

3. *After Birth.*

The factors acting after birth which are capable of producing, or assisting in the production of, amentia may be considered under the following headings: (1) Traumatic; (2) toxic; (3) convulsive; (4) nutritional.

It may be said at the outset that, although most of these conditions *may* give rise to amentia unaided, the number of cases solely and simply due to them is relatively small, and for the most part their influence is contributory or exciting only.

1. *Traumatic.*—An injury to the child's head in the early months of life, or whilst it is still within the uterus, is a frequently alleged cause of mental defect; but in most cases careful inquiry will serve to show the extremely trivial nature of the injury received, and will make it abundantly clear that it could have no connexion with the patient's deficiency. In other cases, however, the serious condition of the patient leaves no room for doubt that a severe trauma has been inflicted, and I believe that in a small number of cases this may be followed by amentia. In such cases it is probable that rupture of vessels has taken place, leading to cortical laceration with subsequent destruction of a localized area of brain tissue, and in most of these patients the amentia is accompanied by epilepsy or paralysis.

2. *Toxic.*—In a certain proportion of cases of acute infectious disease occurring in infancy, such as scarlet fever, enteric, whooping-cough, diphtheria, and measles, as well as in otitis and rhinitis, there are definite signs that a cerebral lesion has been produced. Perhaps in some of these affections (particularly pertussis) the lesion is a cortical or meningeal hæmorrhage; but in most the symptoms rather point to a direct poisoning of the brain cells; accordingly I have grouped them together as "toxic." In addition to these it seems now certain that the brain or its meninges may be primarily affected by the *Diplococcus intracellularis*, and by a process analogous to acute anterior poliomyelitis. The majority of children so affected die; others make a complete recovery; whilst in a few

others death does not take place, but a permanent legacy remains in the form of paralysis, epilepsy, or amentia. I shall refer to these cases again in considering the pathological and clinical features of secondary amentia; here it will be sufficient to state that, although toxic processes of this kind may undoubtedly produce amentia, the number of such cases is relatively small. In exceptional instances the amentia may be caused indirectly, in consequence of the morbid process involving the organs of special sense, or by "sense deprivation."

It is probable that the variety of amentia known as "infantile cerebral degeneration" or "amaurotic family idiocy" is really due to some form of toxin, although the pathogenesis of this disease is as yet very obscure.

Sunstroke, although frequently alleged, is not really a very common cause of mental defect. I have, however, seen three cases in which the closest inquiries failed to reveal any other cause, so that I am disposed to think that the exposure of a young infant to a very hot sun may occasionally produce a cerebral lesion and lead to an arrest of development. In two of the cases the exposure occurred in India; in the third, in this country during a very hot summer, and all of them were attended with unconsciousness. It is likely that many of the cerebral illnesses of childhood attributed to sunstroke are really the result of microbic infection.

The above are the chief etiological factors responsible for the gross cerebral lesions which sometimes lead to amentia. In addition, cerebral new growths may occasionally so act.

3. *Convulsive.*—Convulsions of some kind or other are amongst the most frequently alleged causes of amentia; but it is easy to mistake cause for effect, and my experience is that in the great majority of cases where the two are associated in early life, both conditions are manifestations of a neuropathic diathesis. At the same time it is perfectly obvious, from what we know of the degrading effects of epileptic convulsions, that the presence of severe fits at a time when brain development is still incomplete will have a most prejudicial effect, and it is highly probable that the child who is subject to frequent convulsions in the first few years of life will fail to attain normal mental development.

A good deal of importance has been attached to *teething convulsions*, and Dr. Shuttleworth found these present in nearly one-third of the admissions to the Royal Albert Asylum. It is often

assumed that convulsions of this kind are totally different from those of epilepsy, but as a matter of fact there is no clear line of division between the two. It is exceedingly rare for the child whose inheritance is good to suffer in this way, although his gums may be extremely painful and swollen, and it will often be found that where convulsions are present during teething, they recur in later life as ordinary epilepsy; indeed, Sir William Gowers states that "a considerable number of cases of epilepsy date from infantile convulsions." In the absence of a neuropathic predisposition infantile eclampsia, independently of brain disease, is exceedingly rare, and amentia due solely and simply to this cause probably hardly ever occurs.

4. *Nutritional.*—A very important question, from the point of view of prevention, is that of the possibility of mental defect being caused by defective bodily nutrition. It is a well-known fact that the physical health and development of the growing child is very greatly dependent upon the quantity and quality of its food, the presence of an adequate amount of sleep, fresh air, light, warmth, etc. Consequently it might be assumed that these, by influencing its general nutrition, would have a corresponding effect upon its brain development. There is no doubt that adverse conditions in these respects may retard mental development, and the same result may follow serious ill-health or disease. I have indeed seen a few cases where the developmental arrears have never been fully made up, so that a condition of permanent amentia has resulted. But such cases are very rare, and on the whole it may be said that these factors, in the absence of hereditary predisposition, have comparatively little causal influence. The same may be said of *shock* and *fright*. It is exceedingly doubtful whether these have ever caused amentia in a normal child, although they may precipitate it in one with hereditary predisposition. *Rickets* is sometimes the accompaniment of mental deficiency, but I doubt whether it is ever its cause. One particular variety of defect, however, *cretinism*, is undoubtedly due to the deprivation of a specific nutritive material.

Etiological Factors in Regard to Local Variations of Incidence.

Before concluding this account of causation, it is necessary to refer to the connexion existing between certain etiological factors and local variations in the prevalence of amentia.

We have already seen (Chapter II.) that the incidence of amentia

is not uniform throughout the country, but that in some localities it is relatively much higher, and in others much lower, than the mean average. Into the cause of this inequality I do not propose to enter, for it is but part of a similar variation in the incidence of mental disease in general, and is therefore beyond the scope of our subject. But there are certain variations in the incidence of amentia relative to other forms of mental disease, and in the incidence of the degrees of amentia relative to one another, which are so closely connected with the question of causation that they must be referred to.

The Incidence of Amentia Relative to Insanity.—The statistics of the Royal Commission show that, broadly speaking, insanity is more characteristic of the urban and industrial, and amentia of the rural, populations of this country. We have already seen that the causes of these two conditions are identical in kind—namely, neuropathic inheritance—but that they differ in degree, inasmuch as the inheritance is usually more pronounced in amentia than in insanity. Now, the towns have been built up and are being steadily increased by the immigration of persons from the country, and it is justifiable to conclude that the persons so migrating will possess the qualities of initiative, enterprise, and mental vigour in a higher degree than those who are content to remain upon the land—that, in short, a comparatively smaller proportion of them will come of a pronounced neuropathic stock. This process inevitably tends to the accumulation in the rural districts of those most saturated with morbid heredity, a state of affairs which is often accentuated by intermarrying, and so the conditions in these areas become more and more favourable to the production of actual mental defect. On the other hand, in our towns and thickly populated industrial centres competition is keen, the stresses and strains of life are severe, alcoholism is rife, consumption is very prevalent, narrow streets are densely packed with overcrowded houses, women advanced in pregnancy continue to work in the mills and factories, infants who should be at the breast are reared artificially, and, in short, all the conditions are present necessary to produce an instability of the higher parts of the nervous system—the precursor of insanity. This, in subsequent generations, may possibly lead to germinal defect and consequent amentia, but the constant immigration drags fresh blood into the vortex, and tends to make insanity rather than amentia the prevailing type of mental abnormality.

The Relative Incidence of the Different Degrees of Amentia.—As has been shown in Chapter II., not only is amentia absolutely more prevalent in rural than in urban districts, but the grosser degrees of defect are relatively in excess also; whilst in the towns mentally defective children are relatively and absolutely more prevalent than in the country. I am of opinion that there are three chief factors of town life which tend to bring about this result—namely, (1) a lessened production, (2) an increased destruction of the more severe grades of defect, and (3) the presence in the towns of cases of delayed development which simulate mental defect, and so cause an apparent increase in the incidence of amentia.

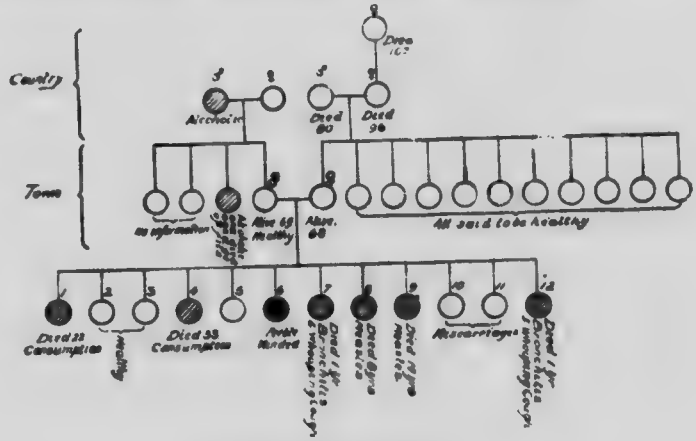
(1) Lessened Production of Severe Defect: This is due to the same causes which bring about a diminished incidence of amentia generally—namely, a lessened neuropathic heredity in the town dwellers. (2) Increased Destruction of Severe Defect: I am unable to give any statistical proof of this, but I think it is probable that the relatively higher infantile mortality of the towns may be not without effect in causing a diminution of the worst grades of defect in these situations, since the mortality of aments would seem to be directly proportionate to the degree of defect. (3) It has already been remarked that a small proportion of cases of secondary amentia are the result of a faulty environment, and this I believe to be more prevalent in town than country. But as we shall see in considering mentally defective children, there is a condition of delayed development which is very much more common in densely congested areas, and which simulates real amentia very closely. I believe this is responsible in no slight degree for the apparent increase of the juvenile feeble-minded in towns. In corroboration of this is the fact that in the towns there is no relative increase of the adult feeble-minded. It is probably true that a small proportion of the male feeble-minded actually born in the towns are gradually squeezed further afield in the struggle for existence; this, however, is in all likelihood balanced by an influx of feeble-minded women from adjacent country districts.

The following family history charts afford graphic illustrations of many of the points referred to in this chapter.

In them amentia, insanity, or epilepsy, is shown as ●; alcoholism, tuberculosis, general ill-health, neuroses, and premature death, as ◐; whilst persons presumably healthy, dying from natural causes, or of whom no information is obtainable, are shown as O.

CHART I.

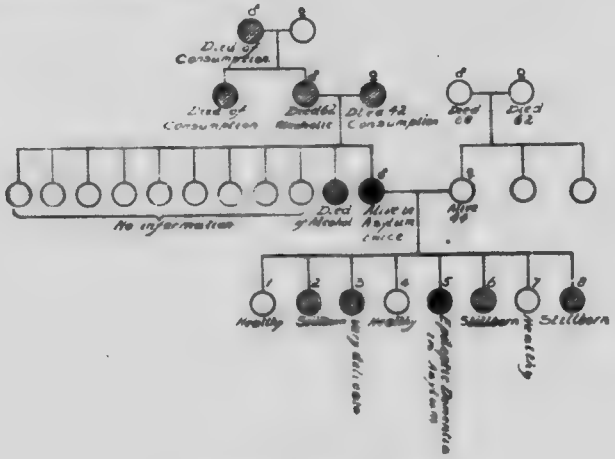
SHOWING HEALTHY ANCESTRY + SLIGHT ALCOHOLIC ANCESTRY.



Case No. 131, *W. J. G.*

CHART II.

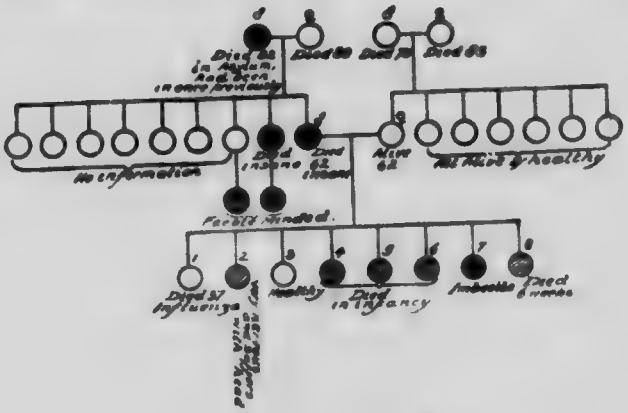
SHOWING HEALTHY ANCESTRY + PATHOLOGICAL ANCESTRY.



Case No. 10, *A. C.*

CHART III.

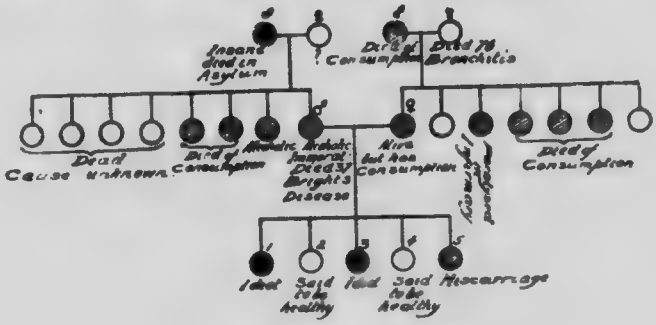
SHOWING HEALTHY ANCESTRY + INSANE ANCESTRY.



Case No. 5, J. W. J.

CHART IV.

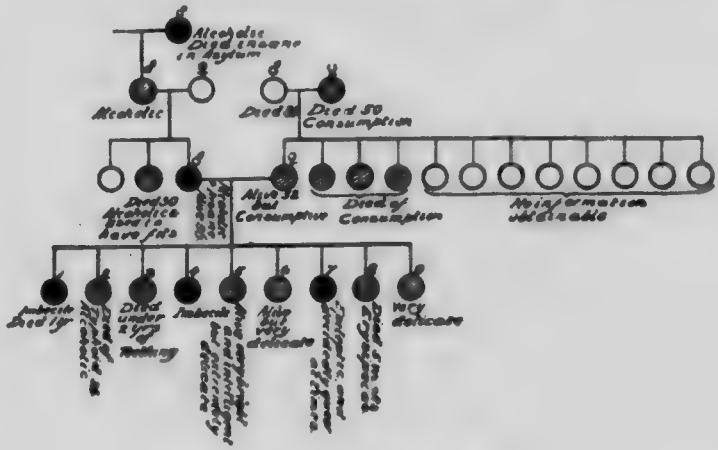
SHOWING THE EFFECT OF INSANE + PHTHISICAL ANCESTRY.



Case No. 99, F. W.

CHART V.

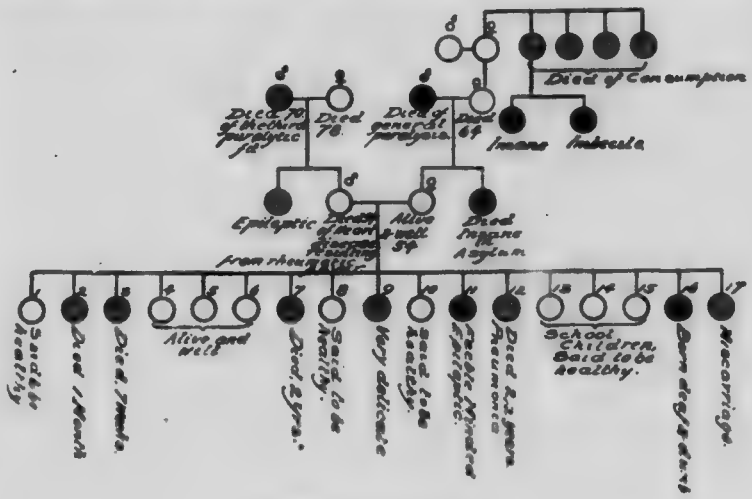
SHOWING EFFECT OF ALCOHOLIC AND INSANE ANCESTRY + PHTHISICAL ANCESTRY.



Case No. 174, C. B.

CHART VI.

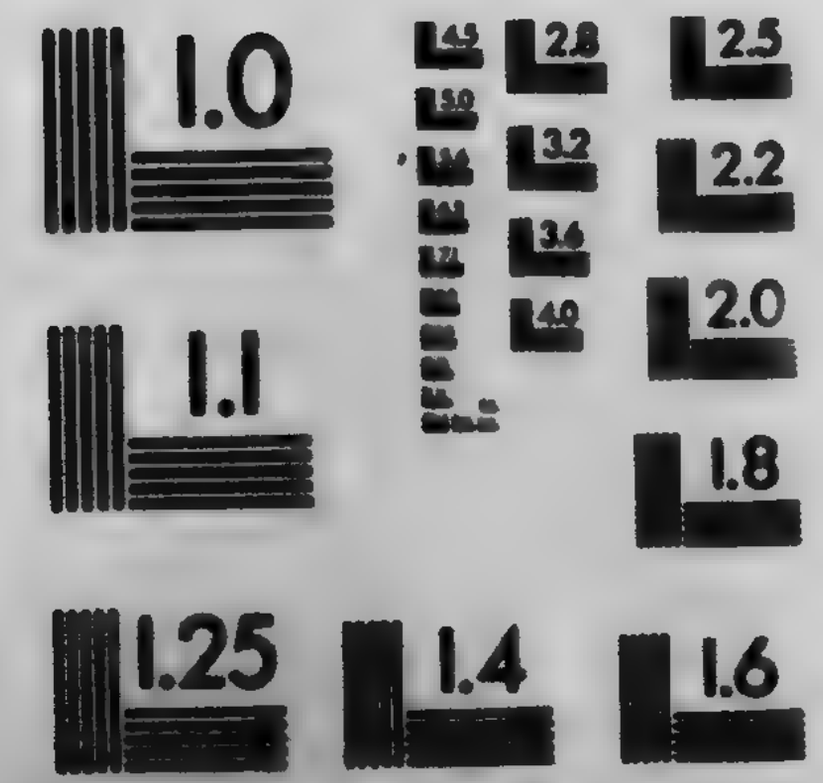
SHOWING THE EFFECT OF DOUBLE MORBID ANCESTRY.



Case No, 9, S. V.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



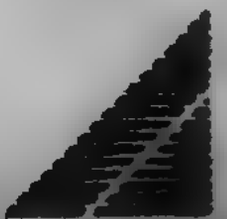


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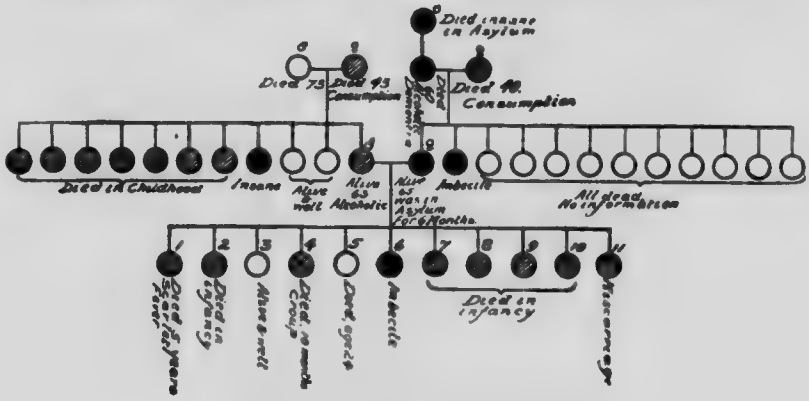
CHART VII.

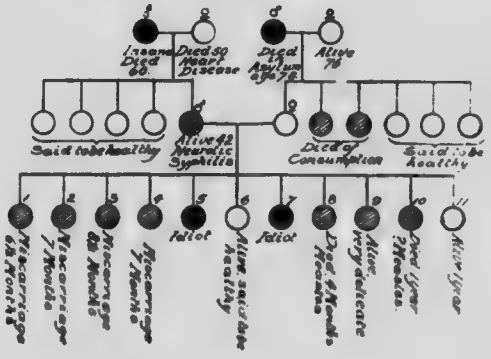
SHOWING THE EFFECT OF DOUBLE MORBID ANCESTRY.



Case No. 83, W. A. M.

CHART VIII.

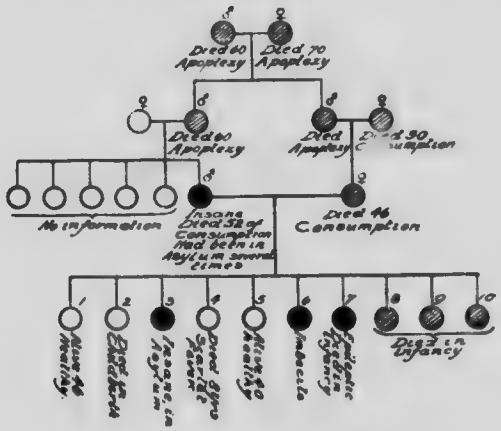
SHOWING THE EFFECT OF A DOUBLE INSANE ANCESTRY + SYPHILIS.



Case No. 97, P. W.

CHART IX.

SHOWING THE EFFECT OF CONSANGUINITY IN A FAMILY WITH A TENDENCY TO VASCULAR LESIONS OF THE BRAIN.



Case No. 70, F. E. V.

NOTE ON MATERNAL IMPRESSIONS (p. 56).—In view of the extreme rarity of authentic cases of amentia due to maternal impressions, the following letter, which I have received as this book is going through the press, merits quotation:

"DEAR SIR,

"I cannot vouch for the actual veracity of the case, but this morning a man told me that some time ago a woman, expecting a child, was frightened by a hen, and that the child, when born, had a little finger with a claw. This has been removed by a surgical operation. The child, however, has now, as the man described it, the disposition of a hen, and is destructive, savage, and unmanageable. Now, can you tell me what home could be found for this child? The D—— Board of Guardians would, I believe, be willing to pay for its maintenance. There is, I know, some home at G——. I do not know whether this place would be suitable. I cannot say how much obliged I shall be by any information that you can give me.

"Very truly yours,

"X—— Y——.

"*November 25th*, 1913."

Obviously the most suitable place for this case would be a poultry farm.—A. F. T.

CHAPTER IV

PATHOLOGY

BEFORE discussing the pathology of amentia, it will be useful if I allude to the salient features regarding cerebral development.

Development of the Normal Brain.

The first indication of the brain is seen very shortly after fertilization of the germ cell, and consists in an expansion of the anterior end of the rudimentary spinal cord to form four primary cerebral vesicles. It is by a series of elaborate infoldings of these vesicles, and by the multiplication around them of the cells composing their walls, that cerebral development takes place. By the time the embryo is six months old the brain has assumed the general shape of the adult, although there is as yet a complete absence of all those secondary fissures and convolutions which are such a characteristic feature of the fully developed organ.

At birth many of these convolutions are present, and the brain weighs* from 280 to 330 grammes. During the first six months of life growth is exceedingly rapid, the weight of the brain at the end of this time being more than double what it was at birth—namely, from 600 to 680 grammes. By the end of the first year the weight has reached about 750 grammes, and from this onward it still continues to grow until the age of twelve or fourteen years, when its average weight is 1,150 grammes in the female and 1,300 grammes in the male. A further slight increase takes place during the next seven years, and at the age of twenty-one the brain has attained the average weight of 1,244 grammes in the female and 1,374 grammes in the male. From this period growth is very slow, until, according to Broca and Peacock, the maximum average weight of 1,269 grammes (45 ounces) in the female and 1,421 grammes

* According to R. Boyd, Phil. Trans., 1860.

(50 ounces) in the male is attained between twenty-five and thirty-five years of age.

This progressive increase in size and weight is due, firstly, to the rapid multiplication, and secondly, to the individual development, of the nerve cells. These arise from the cells lining the floor of the primitive cerebral vesicles, and at first they are of one uniform indifferent type. Subsequently, however, differentiation occurs, and features appear which are characteristic, and which persist throughout life. It is as a result of this differentiation that the brain cortex acquires its peculiar laminated appearance. Coincident with lamination delicate protoplasmic processes arise from these nerve cells, and, pursuing definite directions throughout the cerebral mass, constitute the association and projection systems of fibres. The former serve to link together in the most complicated manner all parts of the brain; they also compose the great association centres of Flechsig; the latter are the pathways by which the brain is connected with the various parts of the body.

Development does not proceed at the same rate in all parts of the brain simultaneously. The nerve cells of certain areas reach maturity much earlier than do those elsewhere, and the frontal and parietal regions, which there is good reason for thinking are those most concerned with the highest intellectual functions, are the last to acquire their mature characteristics. In the frontal lobes of the seven-months embryo lamination has not yet appeared, and the cells are of a uniform undifferentiated type (neuroblasts). These are small round cells with a close and readily stainable reticulum, but quite devoid of processes, and they lie embedded in a matrix which, in the hardened and stained section, somewhat resembles the grain of marble. In the eight-months embryo the neuroblasts are somewhat larger, the reticulum is less close and has less affinity for stain, but there are as yet no definite processes. At this age it is possible to make out the beginning of lamination in this region of the cortex. In the child of two weeks old (extra-uterine) the cells have made a considerable advance, and they are now readily recognizable as nerve cells. A cell body is present, although the protoplasm of this differs greatly from the mature cell, being very vacuolated, and liable to break away from the nucleus. At this age also the cells of the pyramidal layer possess an apical process, and occasionally other processes are present; but the apical one is always the best developed, and appears to be the first formed.

Finally, a few years after birth the cell has assumed its mature character, and possesses axons, dendrons, and gemmules. In other regions of the brain development takes place earlier, and in the motor area of the eight-months embryo medium-sized pyramidal and also Betz' cells are readily recognizable. Indeed, Dr. J. S. Bolton* says that the Betz' cell area can be accurately mapped out as early as the eighteenth week of embryonic existence.

The processes of the fully developed nerve cells communicate with one another (physiologically, if not anatomically) in an exceedingly complicated network, forming the bands and systems of association fibres already mentioned. It is by means of them that nervous impulses travel to and from all parts of the cerebro-spinal system, and it has even been suggested that the nerve cell is of secondary importance, and only serves the purposes of nutrition. However this may be, there is a definite relation between the appearance of the cell as seen under the microscope and the state of the fibre, and the condition of the cells forms a convenient and reliable index of the presence of disease.

There can be no doubt that the number and complexity of the cell processes, particularly those forming the association systems, are intimately connected with the degree and complexity of cerebral activity, and it is highly probable that the intellectual expansion which takes place after puberty is due to their numerical increase and the elaboration of their connexions. It has, indeed, been shown by Kaes† that a progressive increase in these fibres can be demonstrated up to the middle period of life, after which he states that growth ceases and a gradual diminution takes place.

Finally, to complete this brief résumé, it may be said that the nerve cells and fibres are embedded in a network of supporting tissue (neuroglia cells and their processes), encased in a series of delicate connective-tissue membranes (the meninges) and the whole organ permeated by a dense ramification of bloodvessels.

Whatever may be the relation of mind to brain, it is now fully recognized that the manifestation of mental activity is indissolubly connected with the cells of the cerebral cortex. Mind develops *pari passu* with their growth, and fails with their decay. Dementia is coincident with their degeneration and death, and, as will presently

* J. S. Bolton and Moyes, *Brain*, 1912, vol. xxxv., part i.

† T. Kaes, *Monatsschrift für Psychiatrie und Neurologie*, 1897; also "Die Grosshirnrinde," etc., Jena, 1907.

be shown, amentia is associated with their incomplete development.

It is apparent from this outline of cerebral development that the period of greatest growth is that between the first appearance of the primitive brain and the end of the sixth month of extra-uterine life; consequently, it is during this period that the demands upon the environment are greatest, and that any adverse factor will be most severely felt. This entirely accords with the general experience that, where secondary amentia occurs, it is the result of an adverse environment during the early months of life. The mental development which takes place after puberty appears to be the result of the elaboration of association systems, and although, theoretically, developmental arrest might occur at this time, such would but rarely be likely to result in any pronounced deficiency. On the other hand, in cases of primary amentia, the condition is rather one of a general *inability to develop* than of an *arrest* of development, and the cause is in existence anterior to the very beginning of embryonic existence.

THE PATHOLOGY OF AMENTIA.

Many mistaken notions still exist with regard to the pathology of amentia. As we shall presently see, in a very considerable number of these patients, particularly the lower grades, there exist gross abnormalities of brain structure, or severe and extensive morbid conditions, which are visible to the naked eye. Accordingly, it was not unnatural that the earlier observers, examining isolated cases in the days when much less was known about the structure of the nervous system than is the case at present, should conclude that in these various anomalies they saw the *fons et origo* of the mental defect. As a consequence, amentia was variously attributed to the presence of porencephaly, hemiatrophy, microgyria, and the like. These views cannot be held to-day. In the first place, it has been abundantly shown that such conditions may exist without any mental defect or deterioration whatever; whilst, secondly, an increased knowledge of the structure of the nervous system, and particularly of the nerve cell, together with a greatly improved technique, has clearly demonstrated the existence of important *cellular* changes in amentia.

In support of the statement that these gross conditions cannot really be the cause of mental defect, the following observations

may be cited: About thirty cases have been recorded of absence or deficiency of the corpus callosum, most of them in idiots, yet Nobiling-Jolly, Eichler, and Klob have each recorded a similar case in which there was no mental peculiarity. Likewise with another frequent accompaniment of amentia—porencephaly. Several cases have been described in which a large cavity existed in one hemisphere, and yet there was little or no appreciable mental change. Schroeder van der Kolk* mentions a number of instances tending to show that a large proportion of one hemisphere may be diseased, and yet the patient show no mental impairment. Finally, with regard to another condition—hydrocephalus—Freud† states it to be an undoubted fact that severe hydrocephalus may exist without any paralytic symptoms; whilst Ziegler‡ states that such malformations, or even still greater defects, may exist in the brain, though during life there was nothing whatever to indicate their presence.

We cannot but conclude, therefore, that although these gross changes are frequently associated with amentia, they are not essential to that condition, and in discussing the question of pathogenesis we must be careful clearly to distinguish between what is essential and what is only accidental.

At the same time it is undeniable that gross malformations and coarse lesions are much commoner in the epileptic and mentally defective than in normal persons, and it is easy to understand, from the description which has been given of the causation and hereditary predisposition of these persons, that such should be the case. On the other hand, there is no doubt that certain morbid processes may, even in the previously healthy brain, produce such an arrest of neuronic development as to bring about amentia.

The essential basis of amentia is an imperfect or arrested development of the cerebral neurones, a fact which is now established beyond doubt by careful microscopical examinations conducted by numerous competent observers. This morbid state of the neurones is brought about by the causes which have already been described in Chapter II. Accordingly, I shall first of all describe these histological changes, relegating the various gross anomalies and diseased conditions to a second place.

* Schroeder van der Kolk, Sydenham Society Transactions, 1861.
† Freud, "Infantile Cerebral Lähmung," Wien, 1897.
‡ Ziegler, "Textbook of Special Pathology," 1896.

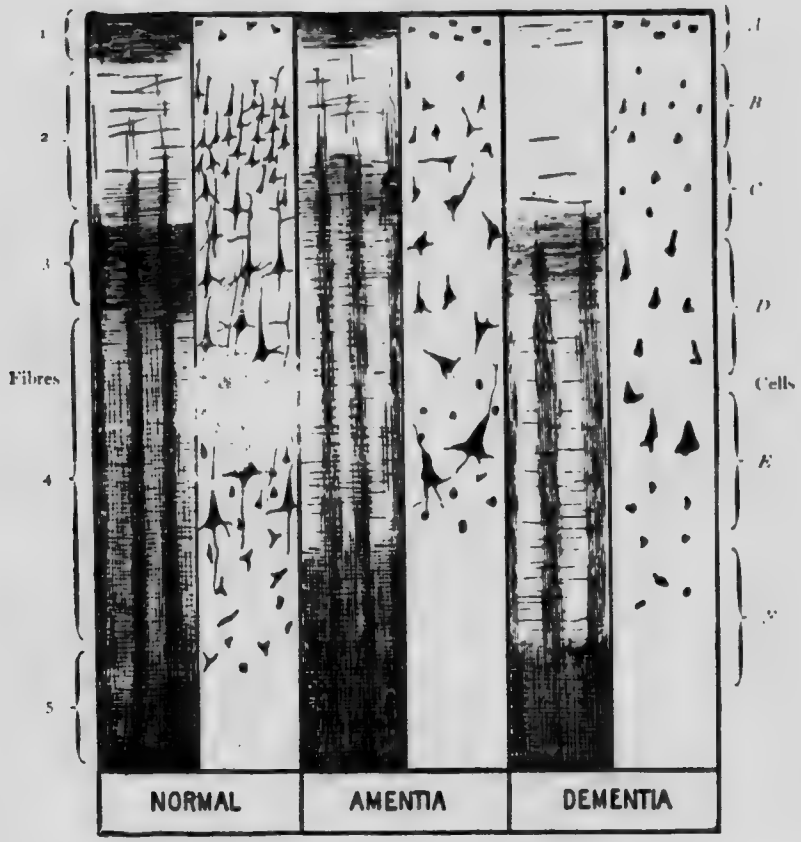


FIG. 9.—Microscopical Sections of the Frontal Cortex in Dementia, Amentia, and the Normal Conditions (Semi-Diagrammatic, drawn by A. F. Tredgold).

On the left of each are shown the *fibres* as they appear in sections stained by the Marchi-Pal method, on the right the *cells* as they appear in Nissl sections. The various layers are as follows:

FIBRES.—(1) *Tangential*, chiefly formed by the ramifications of the collateral processes from cells at *A*, *B*, *C*, and *D*, also the terminals of some of the fibres forming the medullary rays. This line is normally well defined; in amentia it is somewhat diminished, in dementia markedly so. (2) *Super-radial*. A few horizontally-coursing fibres are situated here, but this region is chiefly occupied by cells (*B*). (3) *Outer line of Baillarger* (line of Vicq d'Azyr), horizontally-coursing fibres composed of collaterals from cells at *B*, *C*, and *D*, a well-marked line normally, much diminished in amentia and dementia. (4) *Inter-radial*, a less definite bundle, probably of similar constitution to (3), diminished in amentia and dementia. (5) *White matter of centrum ovale*. The vertical bundles are composed of axones from *B*, *C*, and *D*, and of medullated fibres from other regions of the brain.

CELLS.—(*A*) *Neuroglia and small irregular nerve cells (molecular layer)*. (*B*) *External granules*. (*C*) *Small* and (*D*) *Medium pyramids*. In amentia there are comparatively few cells in these layers, and those present are irregular in arrangement and of incomplete development; in dementia many of these cells are in an advanced state of degeneration. (*E*) *Large pyramids*, similar changes to those in the preceding layers, but not so extensive. (*F*) *Deep granules and polymorphous cells*. It will be noticed that in amentia the whole cortex is much thinner than in the normal condition. This is principally due to the defective development of the cells at *C*, *D*, *E*, and *F*, but especially to those at *C* and *D* and, according to Roncoroni, at *F*.

To face page 74.]

The Histology of Primary Amentia.

Nerve Cells of the Brain Cortex.—As compared with the nerve cells of the healthy brain, those of the ament are characterized by the following conditions: (1) Numerical deficiency; (2) irregular arrangement; (3) imperfect development of individual cells; and on the whole it may be stated that the amount of change discoverable by the microscope is directly proportionate to the degree of mental deficiency present during life.

1. *Numerical Deficiency.*—Although an actual enumeration of the nerve cells present in these cases cannot be made, I am convinced, from the careful examination of a large number of sections, that the cells composing the grey matter of the cerebral cortex are decidedly fewer than in the normal brain. In many cases this paucity of cells produces a decrease in the thickness of the cortical grey matter which is obvious to the naked eye (see Fig. 9, Plate I.). Further, although the cells of all the layers are fewer than normal, it is the small and medium-sized pyramids which are most diminished in number. Hammarberg, as the result of a most elaborate and careful series of observations, arrived at a similar conclusion.

2. *Irregular Arrangement.*—Hammarberg* states that the arrangement of the cortical cells in amentia does not differ from the normal but my own experience, as also that of several other observers, is to the effect that an irregular and haphazard arrangement is very characteristic of this condition. The pyramidal cells show the most change, although this, of course, may be simply due to the fact that the form of these cells renders any irregularity more apparent. Throughout the brain there are in this layer numbers of cells lying horizontally, obliquely, or completely upside down, even where there is no accompanying sclerosis, and where sclerosis is present the irregularity is often extreme.

3. *Imperfect Development.*—As early as 1879 Bevan Lewis† drew attention to the presence, in certain forms of amentia, of incompletely developed nerve cells, and similar cells were present in cases which I examined. When stained by Nissl's method they have the following characteristics: The nucleus is large and ovoid in

* Hammarberg, "Studien über Klinik und Pathologie der Idiotie," Upsala, 1895.

† Bevan Lewis, "Textbook of Mental Diseases," 1899; also *Brain*, October, 1879.

shape; the nuclear membrane and intranuclear network are very distinct. The nucleolus is often eccentric, so that in some sections it cannot be seen. The cell outline is distinct, but, instead of being pyramidal, it is globular or pyriform in shape, and angles are completely wanting. The processes of the cell are exceedingly few, and in many instances one only can be seen (see Frontispiece, Fig. 4). This paucity of dendrons and also of gemmules is still more evident in sections stained by the silver method.

I think it cannot be doubted that the conditions here described are due to incomplete development. I have never seen such cells in any human brain other than that of an ament; it is, however, interesting to note that, according to Bevan Lewis, similar cells exist normally in the second and third layers of the cerebral cortex of the ape. Bevan Lewis was only able to discover these immature cells in cases of amentia complicated by epilepsy, and he thought they did not occur in pure amentia; but I have seen them in cases in which epilepsy was absent.

In addition to the above, the cerebral cortex of the pronounced ament nearly always contains a large number of other cells whose development is even less complete, and which closely resemble the undifferentiated neuroblasts already described as composing the normal frontal cortex up to the eighth month of embryonic existence. In these there is practically no cell body, or at most a few irregular protoplasmic strands; the nucleus is large and globular, the intranuclear network very distinct, and often disposed as several fine lines which divide the nucleus into compartments. In fact, they are undifferentiated and undeveloped neuroblasts, and in areas of localized agenesis—such, for instance, as are seen in microgyria—there is often no other kind of cell to be seen (see Frontispiece, Fig. 1).

There is another condition of the cortical cells which is exceedingly common in these cases—namely, pigmentation. This does not occur in the immature cells above described, and is chiefly seen in the deeper pyramidal layer, in which it is often a very marked feature. The pigment is generally situated at one angle of the cell, away from the nucleus, but at times it is so abundant as almost completely to fill the cell (see Frontispiece, Fig. 7). It is yellow in colour in Nissl or polychrome sections, but appears dark brown or almost black in those stained with Marchi's fluid, and hence gives to these sections a most striking appearance. In several of my cases it was

particularly pronounced in the cells of the hippocampus (see Frontispiece, Fig. 8). The exact nature and significance of this pigment is unknown, though the reaction with Marchi's fluid would suggest that it was of a fatty nature. I have seen a similar pigmentation, but to nothing like the same extent, in the central nervous system of patients who have suffered from chronic nervous disease (*e.g.*, disseminated sclerosis, amyotrophic lateral sclerosis, progressive muscular atrophy, chronic insanity, etc.). Its occurrence in these conditions as well as in aments would suggest that it is an indication of defective metabolism, in which the anabolic processes cannot keep pace with the katabolic. The pigment is nearly always associated with a diminution in the number and size of th Nissl bodies.

Situation of the Cellular Changes.—With regard to the layers in which these imperfections are most evident, it was stated by Bevan Lewis that embryonic cells were particularly numerous in the layers of small and medium pyramids, and my own observations are entirely in agreement with this. Incompletely developed cells occur, it is true, in all the cortical layers, and in extreme cases of idiocy they may even be seen in the spinal cord; but it is in the small and middle pyramidal cells that the greatest change is evident. In view of the fact that these cells are normally amongst the last to attain their full development, also that they are the earliest and most affected in dementia resulting from epilepsy and chronic insanity, this fact is of considerable interest.

Roncoroni,* who has made a very thorough histological examination of the cortex (second frontal convolution) of 33 epileptics and 24 criminals, finds that 24 of the epileptics showed an absence or marked reduction in size of the deep granular layer, whilst in 10 of them there were anomalies in the arrangement of the pyramidal cells, the main processes of which were directed obliquely and transversely, instead of vertically. The pyramidal cells were also diminished in number and of irregular development. He found similar changes in the granular and pyramidal layer in a majority of the congenital criminals, and says that such conditions were not present in the brains of any normal persons, nor in insane criminals or epileptics other than those of degenerate type. Roncoroni, extending his histological examination to the brains of monkeys, dogs, and other of the lower animals, arrives at the conclusion that

* Roncoroni, *Archiv. di Psichiat.*, 1905, vol. xxvi., fasc. 4, 5, and 6.

the molecular layer tends to decrease in the higher evolutionary types, and he regards the cells of this layer as being concerned with automatic functions rather than with the higher psychic processes. It is, he considers, in agreement with this view that in certain human degenerate types the molecular layer is disproportionately large. Roncoroni's account, of course, refers to the cells of the cerebral cortex. With regard to fibres, Kaes is of the opinion that the outer layers of tangentially running fibres subserve higher processes than do those more deeply placed.

In cases of pronounced amentia these incompletely developed pyramidal cells are found in all regions of the cerebral cortex. There are, however, two situations in which they are most frequent —namely, the prefrontal and, to somewhat less extent, the parietal lobes. It would therefore appear that it is these regions which are chiefly concerned in the highest mental processes, for it is these same regions which show the greatest amount of degeneration in dementia. On this point the observations of J. S. Bolton,* whose work on the morbid histology of the cortex cerebri is probably unsurpassed for painstaking care and completeness, are of great importance. Bolton concludes that "the cellular elements throughout the cortex cerebri which are specially concerned in the performance of associational functions are those of the pyramidal layer of nerve cells; the great anterior centre of association of Flechsig in the prefrontal region is underdeveloped on the one hand in all grades of primary mental deficiency, and on the other hand undergoes primary atrophy *pari passu* with the development of dementia. This region of the cerebrum is therefore concerned with the performance of the highest co-ordinating and associational processes of mind."

It is not improbable that the anatomical basis of psychic epilepsy and insanity will ultimately be proved to consist in an inherited instability, defective metabolism, or tendency to premature degeneration of these cells, the actual exciting cause of the disease being supplied by toxins or any of the numerous forms of stress and strain incident to modern life.

It is necessary to remark that embryonic cells similar to those described (neuroblasts), are present in the normal adult brain, also that cells which appear to be of perfect development may be seen

* J. S. Bolton, "Amentia and Dementia," *Journal of Mental Science*, April, 1905, *et seq.*

in the brain of the idiot, even of the most pronounced type; but whereas in the normal the number of neuroblasts is comparatively small, and the great majority of the cells have attained complete development, in the latter the reverse is the case, the bulk of the cells being in an immature condition, and many of them also showing further indications of defective function in the presence of considerable deposits of pigment. Moreover, the proportion of such immature cells appears to be directly related to the degree of mental deficiency, and in the milder degrees the microscopical condition is rather one of paucity of cells and irregular arrangement than of pronounced imperfection of the individual cells.

Nerve Fibres of the Brain Cortex.—The bands of tangentially coursing fibres comprising the association systems show a very definite diminution in cases of severe amentia, so great, indeed, as often to be apparent to the naked eye. Generally speaking, the most marked alteration occurs in the fibres composing the outer line of Baillarger, next in the super- and inter-radial bundles, whilst the superficial tangential fibres are somewhat less affected (see Fig. 9, Plate I.). The regions of the brain most involved are the frontal and parietal lobes; in the motor areas the change is comparatively slight, and in the occipital lobes there is often little observable diminution.

The Neuroglia.—*Sclerosis*, or overgrowth of neuroglia, occurs in some form or other in a considerable proportion of cases. Dr. Wilmarth* found it in no less than one quarter of the hundred brains he examined. The cause of this condition cannot always be determined; in some cases it is probably the final result of toxic or vascular lesions; in others it would appear to be a developmental anomaly, and to take place in consequence of the diminished multiplication and development of the higher elements—the nerve cells—being, in fact, a substitution product. Sclerosis may be diffuse or circumscribed. As an example of *diffuse* sclerosis I may mention a brain which I examined from an idiot dying at the age of twenty years: the whole organ was small, 896 grammes in weight, and exceedingly firm—in fact, almost cartilaginous in texture throughout. There were no localized patches, but microscopical examination showed the presence of a dense overgrowth of neuroglia diffused throughout all parts of the brain, including the basal

* A. W. Wilmarth, "Report on the Examination of One Hundred Brains of Feeble-minded Children," *Alienist and Neurologist*, October, 1890.

ganglia and cerebellum. This involved the white as well as the grey matter, and was accompanied by a marked numerical diminution as well as irregular and incomplete development of the nerve cells and their processes. There were no signs of recent degeneration, but the piâ-arachnoid membrane was somewhat thickened in places. The patient had always been helpless and unable to do anything for herself, but no definite paralysis was noticeable. She was subject to constant choreiform movements, but there were no convulsions.

In other cases the overgrowth of neuroglia takes the form of circumscribed nodules, which are found in two chief situations. The commonest site is the grey matter of the cerebral cortex, which may be occupied by a large number of sharply circumscribed sclerotic areas varying in size from a pin-head to a hazel-nut, or even larger. As generally seen, these are pale firm masses which project above the level of the affected hemisphere, they are often marked by a central umbilication, and the investing piâ membrane strips from them with unusual readiness and without causing decortication. This condition was first described by Bourneville,* but many examples have since been recorded under the name of *hypertrophic, nodular,* or *tuberous sclerosis* or *gliosis.* The majority of the patients have been markedly mentally deficient and have suffered from epileptic convulsions. The patches consist of a dense interlacement of neuroglia fibres with a varying proportion of cells (probably dependent upon their age), and the lamination of the adjoining grey matter is often considerably distorted. The other most common site is the floor of the lateral ventricles, which may be studded with a number of protuberances the size of small peas. Microscopical examination shows these to consist of almost pure glia tissue, the fibres of which are usually arranged in whorls around the centre of the nodule. Finally, a dense band of fibrous neuroglia is occasionally seen immediately under the piâ upon the surface of the hemisphere, closely applied to the cortex like a cap.

When neuroglial overgrowth is present to any considerable extent, it produces a marked increase in the weight and consistence, and often in the size, of the brain. With the lapse of time it tends to contract, and the relative age of the cortical protuberances may be

* Bourneville, "Recherches sur l'Idiotie," etc., Paris, 1893; see also Joseph Sailer, "Hypertrophic Nodular Gliosis," *Journal of Nervous and Mental Disease,* 1898, p. 402, in which an account is given of previously recorded cases; also Freud, "Infantile Cerebral Lähmung," p. 136.

gauged by the size and depth of their central umbilication. It is probably an early stage of extensive neurogliosis which gives rise to the cranial enlargement in the hypertrophic form of amentia, and this condition is not infrequently called "hypertrophy of the brain." The hypertrophy, however, concerns the supporting, and not the true nervous tissue.

Regarding the manner of production of localized sclerosis there is much diversity of opinion, although the lesions suggest some kind of vascular causation. Jendrassik and Marie point out that the first histological change always takes place around the small cortical arteries, and in a case of Freud's a sclerotic patch was considered to be undoubtedly the result of an embolus of a branch of the middle cerebral artery. Strümpell sees in it a possible after-effect of his polio-encephalitis acuta infantum. Moreover, the view of vascular origin derives support from the fact that in some cases small collections of hæmatoidin crystals have been seen, evidently indicative of old hæmorrhages. It is therefore not improbable that some, at all events, of these cases of tuberous sclerosis have their origin in one or other of the vascular cerebral lesions occurring before birth or in early infancy, although Vogt* is of the opinion that they are to be regarded as developmental anomalies. The nerve cells are in many cases entirely absent from these patches, but whether this absence is the cause or consequence of the gliosis is unknown. Where nerve cells occur they are rarely healthy, some being in a state of imperfect development, whilst others are atrophied, distorted, or undergoing chronic degeneration (see Frontispiece, Fig. 5). The contiguous portion of the cortex is usually very irregular. The nerve fibres rarely show any acute degeneration, although the tangential and association pathways of the brain and the efferent tracts of the cord are often considerably diminished in size.

Bloodvessels.—As a rule the bloodvessels of the brain in cases of primary amentia show little or no departure from the normal. Occasionally hyaline degeneration is present; or there is a collection of pigment, similar to that in the nerve cells, disposed around the nuclei of the capillary endothelium. But these conditions are not constant, and I do not think they have any causal relationship to the amentia.

* H. Vogt, *Monatsschr. f. Psych. und Neurol.*, 1908, Bd. xxiv.

The Histology of Secondary Amentia.

As has already been stated, the difference between primary and secondary amentia is that, whereas in the former the full development of the neuroblasts cannot take place by reason of an intrinsic vital deficiency, in the latter their development is arrested by some external cause. This cause may operate generally, as in cretinism, or its effect may be local, as in acute polio-encephalitis or the vascular changes occurring in birth injuries. In many of these cases the nerve cells present similar histological features to those in the primary form, although it may be possible to infer that the condition is secondary from the localized nature of the agenesis and the presence of softening, sclerosis, chronic inflammation, or other signs of disease in an otherwise well-developed brain.

In a considerable number of these secondary cases, however, degeneration of nerve cells subsequently takes place, this being often accompanied by more or less dementia. Where this happens, the detection of incompletely developed cells may be exceedingly difficult, just as the original amentia may be unrecognizable in the midst of the dementia. Such degeneration is a slow and chronic process, there being rarely any acute change discoverable by Marchi's method of staining. It begins as a chromatolysis, with accumulation of brownish-yellow granular pigment; this is followed by a gradual atrophy of the axon and dendrons, and then by a shrinkage of the cell body. Later, disintegration of the nucleus and nucleolus occur, and this is often followed by sclerosis.

The cerebral vessels sometimes show indication of this chronic degeneration in a thickening of their walls; whilst the endothelial cells of the capillaries and the adventitia of the smaller arteries frequently contain a considerable deposit of brownish-yellow pigment (staining black with Marchi's fluid) similar to that met with in the nerve cells. In cases of sclerotic amentia indications of old hæmorrhages, in the shape of hæmatoidin crystals, are not infrequently met with.

Morbid Anatomy.

Gross Developmental Anomalies and Pathological Lesions.—Although the essential pathological condition underlying amentia is one of imperfect or arrested development of the cortical cells, yet in a considerable proportion of cases anomalies of structure occur

which are sufficiently gross to be recognizable by the naked eye. These fall under two headings, viz.: (1) Faults of development, and (2) Lesions resulting from disease. The former occur in cases of primary amentia only, and they are obviously a more gross manifestation of that same germinal blight which has produced the cellular imperfection. The latter are the after-effects of pathological processes which on the one hand produce secondary amentia, and on the other may complicate primary amentia. The following are the chief of these developmental anomalies and lesions.

The brain of many mild aments, in its size, weight, and general appearance, may not be markedly different from the normal; but in the more pronounced degrees of mental deficiency differences are usually obvious. I have never yet seen the brain of an idiot, a low, or even medium-grade, imbecile, which could be regarded as normal upon careful naked-eye examination. Sometimes it is too large, when sections will show that it contains an excess of glia tissue. More often, however, it is too small, and the average weight of the encephalon of the ament, even excluding cases of microcephaly, is several hundred grammes less than the average of the ordinary population. In many instances the texture is either abnormally soft or unusually dense. In many cases, also, there is either a decided peculiarity in the whole configuration, or the convolutions are irregular and of markedly diminished complexity. In addition there are often gross malformations of development. In cases of secondary amentia these changes may be little marked, but they are generally replaced by some obvious sign of disease.

Malformations of the central nervous system vary from a trifling peculiarity of configuration or anatomical arrangement to a complete suppression of important structures, such as is seen in anencephalia, non-development of the medulla, or even absence of the spinal cord. Such severe conditions as these are, of course, incompatible with life, and even if the children were born alive, they could only survive a few hours. The malformations ordinarily seen in post-mortem examinations of aments are much less severe, and are in most instances situate in the cerebral hemispheres or the cerebellum. This is doubtless owing, as Ziegler says, to the fact that these parts "in their development from the primary cerebral vesicles undergo the greatest amount of growth and the most important transformations."

Most of these anomalies are forms of localized hypoplasia, which in some instances may be the result of disease or vascular occlusion; in others, however, they are due to defects in the formative material of the brain. In the cerebral hemispheres the secondary, or even the primary, fissures may be imperfectly formed, there may be agenesis of a lobule or a whole group of convolutions, or there may be a general undergrowth of the whole of one hemisphere. This latter condition is called *cerebral hemiatrophy*, and the affected hemisphere may weigh from 200 to 300 grammes less than the opposite one. In a considerable proportion of cases a condition of *microgyria* is seen, in which a group of contiguous convolutions are represented by thin membranous folds, almost devoid of nervous tissue, and somewhat resembling the conduplication seen in the unexpanded petals of a flower-bud. *Porencephaly** is another not uncommon pathological finding, and is due to a non-development of the central convolutions around the inferior extremity of the Sylvian fissure. As a consequence, a deep funnel-shaped cleft is produced which extends down to, and communicates with, the cavity of the lateral ventricle. This cleft is lined by the piâ and bridged over by the arachnoid membrane, the contained space being filled with cerebro-spinal fluid. A somewhat similar depression may arise as the result of disease of the brain matter external to the lateral ventricle, which in many instances is brought about by a lesion of the Sylvian artery. This condition, as well as other circumscribed and cystic depressions of the brain surface, or even severe hemiatrophy, are often described as *pseudo-porencephaly*.

Other more uncommon developmental anomalies of the encephalon consist of malformations of the basal ganglia, deficiency or absence of the corpus callosum, fornix, optic thalami, corpora quadrigemina, and corpora mammillaria. Arndt and Sklarek,† in a post mortem examination on an imbecile girl aged sixteen years who died in the Dalldorf Asylum, found that, in addition to deficiency of the corpus callosum, there were abnormalities of the pillars and commissure of the fornix, of the gyrus fornicatus and fibres of the anterior commissure, as well as absence of the psalterium and septum pellucidum. They quote twenty-nine recorded cases of deficiency of the corpus callosum, most of them accompanied

* See Kundrat, "Die Porencephalie," Graz, 1882; also Audry, "Les Porencephalies," *Revue de Médecine*, June, 1888.

† Arndt and Sklarek, *Archiv f. Psychiat.*, Bd. xxxvii., Heft 3.

by other defects of brain structure, and the majority of the patients being idiots.

Anomalies of the cerebellum consist chiefly of a general hypoplasia, which occurs with considerable frequency in the Mongolian type of amentia, as well as of various forms of localized agenesis similar to those met with in the cerebrum.

It is to be remarked that such lesions, whether due to faults of development or to disease, are very likely to interfere with the growth, or to cause degeneration, of other portions of the nervous system with which the affected areas are functionally related. Thus, in lesions of the motor cortex there is sclerosis of the corresponding efferent tract throughout the pons, medulla, and cord, and corresponding to this there is often a numerical diminution of the anterior horn cells of the cervical and lumbar enlargements. Lesions of the basal ganglia may give rise to secondary changes in the cerebellum and its superior peduncle of the opposite side, also in the fillet and interolivary layer of the pons and medulla of the same side. Lesions of the motor cortex may even interfere with the development of the great association centres. In examining anomalies of the nervous system, it is thus not always easy to disentangle those lesions which are primary from those which are in this way secondarily produced.

Hydrocephalus is a not uncommon accompaniment of both the primary and secondary forms of amentia; it occurs in two varieties. In one variety the excess of cerebro-spinal fluid occurs within the ventricles, and is then known as "internal hydrocephalus." In the other it is situated external to the surface of the brain, and is then known as "meningeal hydrocephalus" or "hydrocephalus *ex vacuo*."

The cause of *Internal Hydrocephalus* is often obscure. Some cases date from early embryonic life; in others the condition first appears in early childhood. Both syphilitic and tubercular lesions have been found, and in other cases chronic thickenings of the choroid plexuses are seen. It is probable that the affection in many instances depends on closure of the communications between the cavities of the ventricles and the subarachnoid space in the transverse fissure; but as to the causes bringing about this closure we know very little. On the other hand, there is no doubt that in some instances internal hydrocephalus may be secondary and compensatory to non-development of the brain tissue. This is probably

so in those cases where it is confined to one ventricle, the substance of the corresponding hemisphere being thin and undeveloped; also in those cases in which it accompanies a general hypoplasia of the cerebrum, such as occurs in microcephaly. Distension of the ventricles, even to a considerable extent, is a not very uncommon finding in microcephalic amentia.

External Hydrocephalus is always compensatory to disease or non-development of the cerebral tissue. The excess of fluid is situate in the subarachnoid space, and always occurs in the vicinity of the local defects. In cases of general atrophy of the convolutions due to dementia, the dilated sulci are filled with pale, clear cerebro-spinal fluid. In conditions of localized disease, or agenesis, on the other hand, the fluid is confined to form a cyst. This is particularly well seen in some cases of pseudo-porencephaly. It may happen for internal and external hydrocephalus to be present in the same brain.

Encephalitis and Meningo-Encephalitis.—These conditions are always indicative of a previous disease of the brain. They are therefore commoner in, but not restricted to, the secondary form of amentia. The cause is one or other of the toxic or vascular lesions which have already been described in the chapter on Causation; but they have no constant relationship to any particular one of them. Encephalitis may result alike from cortical hæmorrhages, thrombosis of the meningeal veins due to asphyxia, or a poisoning of the cortical cells. Sachs* considers chronic meningo-encephalitis to be a common result of the meningeal hæmorrhages occurring during birth, but Freud is of opinion that these cases do not commonly terminate in a chronic inflammatory process between the membrane and underlying brain surface.

There can be no doubt that in the majority of cases of amentia, which are due to, or accompanied by, "birth paralysis" (Little's disease), meningeal hæmorrhage is present, although in occasional instances the hæmorrhage may be within the brain cortex. Where the bleeding is from the membrane, the clot is usually between the pia and the brain surface, and it may be situated over the vertex or at the base. Holt† says that the posterior part of the base is much the more frequent site, and that a diffuse hæmorrhage is

* Sachs, "A Treatise on the Nervous Diseases of Children," New York, 1895.

† R. Holt, "Diseases of Infancy."

commoner than is a single circumscribed clot. He further states that, whilst the quantity of blood extravasated varies from one drachm to four ounces, it is usually about one ounce.

However produced, inflammation of the cerebral cortex usually leads to marked histological changes. In most cases there is considerable distortion of all the affected tissue, so that the lamination is exceedingly confused and irregular. In many cases the normal layers are almost indistinguishable, and the cortex consists of a haphazard collection of various-sized cells. Associated with this there may be a clear, pale layer devoid of cells at a little distance below the brain surface. In some cases areas of sclerosis are found, or there is a more diffuse proliferation of the neuroglia; in other cases there are small localized softenings. The vessels are often numerous and the perivascular spaces dilated; whilst if the lesion occurs in the motor region, there is usually a chronic degeneration of the efferent tract, which may be traced through the medulla and cord. The term "agenesis corticalis" has been applied by Sachs to this condition where of intra-uterine origin.

In meningo-encephalitis the piâ-arachnoid is found to be considerably thickened, opaque, unduly vascular, and firmly adherent to the underlying brain tissue, from which it cannot be detached without causing decortication. In some cases the softening and disintegration of the brain substance is definitely circumscribed; the space thus formed is filled with cerebro-spinal fluid, and bridged over by the investing membrane, forming a so-called arachnoid cyst.

In a certain number of cases of amentia, even where there are none of these gross lesions, dementia supervenes. There is then usually found more or less atrophy of the convolutions, with considerable excess of fluid in the widened sulci, and in these cases the membranes are also thickened and opaque; but the piâ-arachnoid strips with unusual readiness, unlike the adhesion in chronic meningo-encephalitis. The dura mater is sometimes firmly attached to the bone, and very occasionally osseous plates and subdural false membranes have been found. Apart from these conditions of disease or dementia, the membranes in persons suffering from amentia rarely show any pathological change.

The Skull.—In most cases of primary amentia the skull is thicker and denser than normal, the diploë often being non-existent. In some instances the sutures are found firmly and prematurely united,

from which arose the erroneous notion that premature synostosis was a cause of idiocy. Where extensive cerebral hemiatrophy exists, whether from disease or congenital anomaly of development, there may be considerable asymmetry of the cranium as seen from the outside; but it often enough happens that no external malformation is noticeable in this condition, the deficiency being associated with a considerable enlargement of the inner table of the skull only. In some of these cases there is no bony overgrowth at all, the space being merely filled with an excess of cerebro-spinal fluid. The various anomalies of external configuration will be described in subsequent chapters.

CHAPTER V

CLASSIFICATION

We have seen that there are two fundamentally different *forms* of amentia; there are also innumerable *degrees;* and it is convenient to describe certain distinctive clinical *varieties*. Unfortunately, the neglect of some authors to make these distinctions clear has had the effect of unnecessarily complicating the classification of mental deficiency, which is in any case a task of sufficient difficulty.

The Forms of Amentia.

The great majority of aments (probably between 85 and 90 per cent.) are the products of a *defective germ plasm*. In consequence of this blight, neuronic development is irregular and imperfect, and a condition of **primary** amentia ensues.

In from 10 to 15 per cent. of cases there is no morbid inheritance and no inherent inability to develop, but the growth of a portion of the brain is interfered with, or arrested by, disease or other adverse *environment*. This condition may be called **secondary** amentia.

At first sight these terms may appear to be synonymous with the older ones—" congenital " and " acquired." They are not so, however, for so-called " congenital " (existing at birth) amentia may in reality be secondary and due to a factor of the environment operating *in utero;* whilst amentia which does not become manifest until late in childhood, and which would be called " acquired," may really be the result of a primary imperfection of the germ cell. I think, therefore, that the terms " primary " and " secondary " are not only more accurate, but materially assist our conception of the real nature of the condition present. As will presently be seen, these two forms are not only essentially different in their etiology, but they often present totally distinct pathological, psychological, and physiognomical features.

But whilst the majority of cases of amentia are readily referable to one or other of these two chief forms, there are a few which seem to be intermediate between them. In these morbid inheritance is present, but the brothers and sisters of the patient are seemingly healthy, and the patient himself has seemed to be well in body and mind until the advent of some "illness," "fright," or "fall," etc., in the early months or years of life. These cases have been called *developmental*, and the term is in some respects very convenient. But inquiries usually show that the exciting factor is of a comparatively trivial nature, quite disproportionate to the mental disability which follows, and such as would be incapable of damaging the nervous system of a healthy child. There can be no doubt, therefore, that in such cases the inherited condition of the nervous system is a factor of the utmost moment, and perhaps the term *delayed primary amentia* would best define the class.

The Degrees of Amentia.

Amentia varies greatly in its degree, irrespective of form or clinical variety. In some cases the defect is but slight; in others it is so severe that mind can hardly be said to be present at all. Between these two extremes there is every gradation; and since the differences are of quantity rather than quality, of degree and not kind, any classification must be an arbitrary one. Esquirol suggested the faculty of speech as a dividing-line; but this is unsatisfactory, as there are quite mild aments who cannot speak. Sollier* proposed the faculty of attention; but this is also far from being a reliable criterion as to the amount of defect. In fact, there is no one psychological faculty or function upon the presence or absence of which we can rely as a means of defining the degree of amentia.

Nevertheless, it is essential, both for purposes of description and administration, that a division should be made, and this, on the whole, is best done by means of three terms which have long been in use, namely—*Feeble-mindedness*, *Imbecility*, and *Idiocy*. To one or other of these degrees we may relegate all aments, although it is to be remembered that the boundary-lines are by no means distinct, and that the one gradually merges into the other. We may, indeed, if necessary, further subdivide each of them into three

* P. Sollier, "Psychologie de l'Idiot et de l'Imbécile," Paris, 1891.

others, and thus describe high-, medium-, and low-grade idiocy, imbecility, and feeble-mindedness respectively.

A concise definition of these three terms is impossible, for the reason that they are used with reference to the amount of general intellectual capacity present; but the chief characteristics of each are summarized in the following descriptions. A definition of amentia has already been given on p. 8.

Feeble-mindedness (High-Grade Amentia).—This is the mildest grade of mental defect. The members of the class are usually able to make tolerable progress in elementary school knowledge; they can read, write, do simple sums, and learn certain elementary facts of geography, history, and the like. They can engage in routine work of a simple character with little or no supervision, and at times with a pertinacity and dexterity which is surprising. They can earn their living if provided with an occupation suited to their capacity and treated with a little indulgence and some oversight. But they cannot lay out the money so earned so as to provide for themselves; they are lacking in the capacity to deal with circumstances out of their routine; they cannot make definite plans for their future; and they cannot co-ordinate their conduct in such a way as to enable them to maintain an existence independently of some outside supervision.

The Royal College of Physicians of London defined the feeble-minded person as "one who is capable of earning a living under favourable circumstances, but is incapable, from mental defect existing from birth, or from an early age, (*a*) of competing on equal terms with his normal fellows; or (*b*) of managing himself and his affairs with ordinary prudence." This definition was adopted by the English Royal Commission and utilized as the basis of classification in their inquiries; but it has been altered in the Mental Deficiency Act of 1913, and the definition of this class, according to the Law of England, is now as follows:

"*Persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others, or, in the case of children, that they, by reason of such defectiveness, appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools.*"

Feeble-minded persons under the age of sixteen years come within the jurisdiction of the education authority by reason of a

special Act of Parliament (Defective and Epileptic Children Act, 1899). On account of this Act they are commonly designated *mentally defective children*, and they are defined in this Act as "*those children who, not being imbecile, and not being merely dull and backward, are, by reason of mental defect, incapable of receiving proper benefit from the instruction in the ordinary public elementary schools, but are not incapable by reason of such defect of receiving benefit in such special classes or schools as are in this Act mentioned.*"

It should be remarked that in America the term "feeble-mindedness" is not thus used specifically of the mildest degree of amentia, but is applied generically to the whole order of amentia, thus being synonymous with the English term "mental deficiency." In that country the feeble-minded grade are designated **morons** (from the Greek word meaning "a fool—a person mainly lacking in judgment and good sense"). This term was first suggested by Dr. H. Goddard, and has much to recommend it, and it is now not infrequently applied to the feeble-minded in England. There has also been an attempt in this country to apply the term "feeble-mindedness" in a generic sense and to include all grades of defect in this euphemistic description, the mildest grade of all (the feeble-minded) being termed "mental defectives." The attempt has not met with much success, however, and since "feeble-mindedness" is in itself a more specific term than is "mental defect," I think it is decidedly better to restrict its use to the mildest degree, and to use "mental defect" as synonymous with amentia.

The capabilities of the feeble-minded, or morons, are so varied that for administrative purposes it is often a matter of practical convenience to subdivide them into three grades. I am in complete agreement with those suggested by Dr. Goddard,* as follows:

1. *High Grade.*—Can do fairly complicated work with only occasional or no supervision; can run simple machinery; can take care of animals; only unable to plan.

2. *Middle Grade.*—Can do routine institution work.

3. *Low Grade.*—Can run errands, do light work, make beds, scrub, care for rooms if there is no great complexity of furniture.

Imbecility (Medium-Grade Amentia).—The imbeciles are characterized by a more pronounced degree of defect. They can usually read and spell simple words of one syllable, can count upon their

* H. Goddard, Twenty-Second Annual Report of the New Jersey Training School for Feeble-minded, 1910, pp. 136, 137.

fingers, can tell their name, say whether it is morning or afternoon, winter or summer; they recognize and name common objects, and can tell for what they are used, but they cannot give a description of them. The *higher members* can assist in fetching and carrying, in helping to clean and scrub, and some of them can perform short tasks unaided if these are simple and they are told exactly what to do. They can also dress, wash, and feed themselves under supervision. In the *medium grade* the capacity for useful employment is less, and practically nothing can be done without oversight; whilst the *lowest grade* approximate to the idiots, and are incapable of any useful work. All of them are capable of guarding themselves against the common physical dangers which threaten existence—for instance, they will not deliberately walk into a pond or put their hands in the fire, and they will get out of the way of a motor-car. But none of them are capable of performing work which will pay for their keep.

In a former edition of this book the imbecile was defined as "one who, by reason of mental defect existing from birth, or from an early age, is incapable of earning his own living, but is capable of guarding himself against common physical dangers," and I think that, on the whole, that is probably the best concise definition of this degree which can be given; but the Mental Deficiency Act now defines imbeciles as "*persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves or their affairs, or, in the case of children, of being taught to do so.*"

I must admit that I fail to see that this definition differentiates in any way between the imbecile and the feeble-minded person; however, it has now received the sanction of Parliament, and must be used for purposes of legal certification.

Idiocy (Low-Grade Amentia).—This is the most pronounced degree of mental defect, and I regard its essential characteristic as an inability to understand and avoid the common physical dangers which threaten existence. In addition, idiots are incapable of performing any useful task, they cannot wash or dress themselves, they cannot form sentences, and the majority of them cannot articulate beyond a few monosyllables. I divide them into two grades—(1) *Partial or incomplete*, in which the primitive feelings of hunger and thirst are present, and the patients may be trained to some extent in habits of cleanliness and self-help, and (2) *complete*,

absolute, and profound, in which there is a lack of the fundamental organic instincts, no power of attention, and a complete incapacity for being taught.

The definition formerly given of this grade, and which is now adopted in the Mental Deficiency Act, defines idiots as "*persons so deeply defective in mind from birth, or from an early age, as to be unable to guard themselves against common physical dangers.*"

It may be remarked that the three terms "idiot," "imbecile," and "feeble-minded" are not infrequently applied to various grades of *de*mentia, particularly the dotage of old age, just as "mental deficiency" is sometimes used generally for that condition. Since this practice is likely to lead to considerable confusion, it is to be deprecated.

In addition to the above definitions it may perhaps be well in this place to include that of moral imbecility. The Mental Deficiency Act defines **moral imbeciles** as "*persons who from an early age display some permanent mental defect coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect.*" I shall deal with this class more fully in a later chapter, but it may here be pointed out that according to this definition moral imbecility is simply amentia, plus a propensity to vice.*

The Varieties of Amentia.

If a sufficiently large series of aments be examined, it will be found that, quite irrespective of their degree of defect, they may be divided into certain groups dependent upon the presence of characters in common. These groups constitute the clinical varieties of amentia. It must be admitted that the division of the natural order of amentia into these clinical groups has hitherto been a somewhat arbitrary process, since authors have been by no means agreed as to what particular characteristics should be made use of for this purpose. There has been, in fact, a confusion somewhat similar to that existing amongst biologists as to the characters which should denote a "species." Considering that it is only recently that the subject has been scientifically studied, this is not to be wondered at, and for some time any classification of this kind must be of a provisional nature, but I think that the fourteen varieties enumerated in the table on p. 97 include all those known

* See Table in Appendix for the English, American, French, and German synonyms for these terms.

at the present time which agree in the common possession of characters of sufficient importance to entitle them to rank as distinct clinical or pathological entities. Some of these fall into the primary, and others into the secondary, group of amentia, and we may briefly refer to these groups separately.

The Clinical Varieties of Primary Amentia.

The majority of persons suffering from primary amentia present no special distinguishing features other than the anatomical and physiological anomalies common to aments in general; they may therefore be termed *simple* aments, and they correspond to the "genetous"* group of Ireland. In others, however, the imperfection of development, for some reason or other, has taken a particular form, and thereby produced marked cranial or physiognomical peculiarities; since these are often associated with special mental characteristics, we are justified in alluding to them as separate varieties. The most important of these are the *Microcephalics* and the *Mongolians*.†

In a not inconsiderable number of primary aments (particularly of the simple variety) there exist severe gross lesions. In many cases these are only revealed after death, but it occasionally happens that they are so pronounced during life as to justify the use of them as a further means of classification. Accordingly, we may describe *sclerotic*, *porencephalic*, and (occasionally) *hydrocephalic* subvarieties of primary amentia. Epilepsy and paralysis are such common complications of all these cases that their presence can hardly be said to constitute separate varieties.

The Clinical Varieties of Secondary Amentia.

Cases of secondary amentia are divisible into two main classes—(1) Those in which the arrested development is the result of a *gross cerebral lesion*; (2) those in which it is due to some external factor adversely influencing *cerebral nutrition*.

Class 1. *Amentia due to Cerebral Lesions.*—Disease of the brain may be due to circulating toxins or mechanical (generally vascular)

* This term is open to the objection that *all* primary aments may in reality be called "genetous."

† Negroid, Grecian, Egyptian, and American Indian types have also been described; but as these are rare, and their characteristics by no means definite, they will not be alluded to further.

causes. These may arise from many different factors which have already been specified, and which will be dealt with more fully in Chapter XIII. Since the lesions themselves present different anatomical features, there are usually produced more or less well-marked clinical subvarieties, which may be enumerated as follows:

1. *Syphilitic.*
2. *Amaurotic.*
3. *Hydrocephalic.*
4. *Porencephalic.*
5. *Sclerotic.*
6. *Paralytic.*
7. *Other toxic, inflammatory and vascular.*

Class 2. Amentia due to Defective Cerebral Nutrition.—The nutrition of the brain may suffer (1) in consequence of qualitative or quantitative anomalies of the blood-supply, or (2) as a result of the deprivation of nervous stimuli from without. Cretinism is the best-known and most important example of the former, although possibly other abnormal states of the blood may so act. The absence of the nervous stimuli necessary to development produces amentia from isolation or sense deprivation. The clinical varieties of this class are therefore enumerated as—

1. *Epileptic amentia.*
2. *Cretinism.*
3. *Amentia due to malnutrition.*
4. *Amentia due to isolation or sense deprivation.*

A few words of explanation are required concerning the position given to epileptic amentia. Epilepsy frequently occurs in primary amentia, but it is then to be regarded as a complication, from which any of these varieties may suffer, rather than a variety in itself. On the other hand, cases occur in which there has been no indication of mental defect prior to the onset of the convulsions, in which, in fact, the amentia is clearly induced by the convulsions; it is therefore secondary, and it is to this class that I restrict the term "epileptic amentia." It is true that such patients are often the victims of a psychopathic inheritance; but it seems tolerably certain that were there no epilepsy there would be no amentia, and epileptic amentia so produced is a well-defined clinical entity. Although little at present is known as to the cause of epilepsy, the trend of recent research is to attribute it to some innate or acquired disorder of metabolism, and hence this variety

TABLE VII.

CLASSIFICATION OF AMENTIA.

Etiology.					*Pathology.*	*Clinical Varieties. (These may be of any of the Three Degrees—Idiocy, Imbecility, and Feeble-mindedness.)*
PRIMARY AMENTIA.	PATHOLOGICAL GERMINAL VARIATIONS	due to	Ancestral alcoholism, tuberculosis, syphilis, and other causes, and manifested by presence in family of amentia, insanity, epilepsy, etc.		A numerical deficiency, irregular arrangement and imperfect development of cortical neurones.	1. SIMPLE. 2. MICROCEPHALIC. 3. MONGOLIAN.
SECONDARY AMENTIA.	SOMATIC MODIFICATIONS	due to	I. GROSS CEREBRAL LESIONS.	(1) *Toxic*—viz., pneumonia, scarlet fever, influenza, measles, syphilis, smallpox, enteric, encephalitis, meningitis, etc. (2) *Mechanical*—viz., hæmorrhage, embolism, thrombosis, trauma.	An arrested development of cortical neurones corresponding to site of lesion. Final results are—Localized atrophy, softening, cysts, sclerosis, pseudo-porencephaly, and hemiatrophy.	4. SYPHILITIC. 5. AMAUROTIC. 6. HYDROCEPHALIC. 7. PORENCEPHALIC. 8. SCLEROTIC. 9. PARALYTIC. 10. *Other* TOXIC, INFLAMMATORY *and* VASCULAR.
			II. DEFECTIVE CEREBRAL NUTRITION.	(1) *Vid* BLOOD: Qualitative and quantitative defects due to specific glandular inadequacy, etc.	General arrest of neuronic development.	11. EPILEPTIC. 12. CRETINISM. 13. NUTRITIONAL.
				(2) *Vid* NEURONES: Isolation or disease of special sense organs leading to defective stimuli from without.	Localized arrest of neuronic development.	14. ISOLATION.

of amentia is provisionally included in the group due to defective cerebral nutrition.

Some years ago I published a scheme devised to show the relationship existing between the etiological factors, pathological conditions, and clinical varieties of amentia.* It is given in a modified form on p. 97. It will, of course, readily be understood that any scheme of classification must at present be provisional, and the only merit I claim for this table is that it attempts to show at one view this relationship as far as it is at present known.

* "Amentia: its Causes, Classification, and Pathology," *Archives of Neurology*, vol. ii., 1903.

CHAPTER VI

NEURO-PHYSIOLOGY AND PSYCHOLOGY

AMENTIA has been defined as an imperfection of mind of such a nature that the person affected is incapable of so adjusting his conduct as to maintain existence without external support. But ability to regulate conduct and maintain existence is no single psychological function; it necessitates the presence, and the harmonious interaction, of many psychological processes, each of which may be defective or abnormal in very varying degree. It is the purpose of this chapter to describe in detail these abnormalities of mind which go to the make-up of amentia.

As to the nature of mind itself, there are two chief opposing views. On the one hand, it is contended that mind is a spiritual something transcending matter altogether, albeit making use of matter (the central nervous system) for its manifestations. On the other hand, it is alleged that mind is no " thing " at all, but merely a process, that it is, in fact, simply the sum total of the ganglionic activity of the brain.

Now, as has already been seen in treating of pathology, all marked cases of mental deficiency are accompanied by imperfections in the structure of the cerebral tissue. In some of the mildest cases these changes may be very slight; indeed, in such the imperfection may possibly lie more in an inadequacy of function than in a demonstrable incompleteness of anatomical structure. It is, however, perfectly justifiable to assume that in all cases the amentia has a physical basis; further, that there is a correlation between the degree of amentia and the extent of material change. This being the case, the most convenient standpoint from which to discuss the psychological defects of these persons is the material one. Whatever the relationship between them may be, there can be no doubt that particular " states of mind " are accompanied by particular

conditions of brain activity. At the same time it is not to be inferred that we are thereby committed to any view as to the nature of mind itself. Although the contrary might be thought, the imperfections of cellular development present in amentia really supply no evidence for or against either the spiritualistic or materialistic doctrine of mind. It is quite possible that in aments there exists a normal spiritual mind which is incapable of manifesting itself because of the faults in the physical machinery. On the other hand, it is equally possible that mind may be simply the sum of various brain functions, and that in the ament mind is defective because the imperfection of anatomical development does not admit of perfect function. But these are matters regarding which we not only have no knowledge, but need here have no concern.

It will be obvious that the investigation of the psychological processes of the defective mind is a matter of very considerable difficulty. The usual laboratory methods require not only co-operation, but also intelligence on the part of the subjects examined, and in the present case both these are lacking. It follows that the ordinary methods of the psychological laboratory are of relatively little use, and consequently our knowledge of the working of the defective mind, even of the defects themselves, must be gained by observation of the conduct and behaviour of these persons in their everyday life and during the performance of their daily occupations, by conversations conducted so as to elicit particular points, and by practical tests of a simple nature. Nevertheless, even by these somewhat imperfect means valuable deductions may be drawn, and although our knowledge is still far from complete, I think sufficient information is available to permit of a tolerably accurate account being given of the mental abnormalities of these persons.

In giving this account it will be convenient to divide the subject into three chief headings, according as the processes relate to *sensation*, *cerebration*, and *action*. To a certain extent such a division is fallacious, for it has no existence in Nature. Mind must be regarded as the totality of nervous activity; it cannot be divided into watertight compartments; and neither sensation, mentation, nor motion can occur independently of each other. Nevertheless, the division is justifiable for purposes of description. It would be beyond the scope of this work to deal at any length with normal psychological processes; it will be sufficient to give a brief descrip-

tion of such facts regarding the development and working of the normal mind as are necessary to an understanding of the abnormalities found in amentia.

SENSATION.

The brain of the new-born child consists of a gelatinoid substance, in which are embedded myriads of embryonic nerve cells; but these cells, or neuroblasts, are so immature that mind can hardly be said to have an existence. It is by means of incoming nervous vibrations transmitted through the peripheral organs and along the avenues of sensation that these neuroblasts derive their chief stimulus to growth, and consequently by which mental activity comes into being. The cerebral cells must, of course, possess an innate capacity to develop; indeed, it is a defect of this capacity which constitutes the essential feature of amentia. But there is every reason to believe that not only is this stimulation from without vital to their development, but that ideation, judgment, reasoning, even will, are dependent upon the quantity and quality of sensations received from the outside world. We may, indeed, say that sensations are the bricks out of which mind is built, and that in their absence the brain cells are incapable of producing a single idea. As in the new-born child, sensation may be present without reason, but reason cannot exist without sensation.

The importance of these afferent nerve currents to mental development is shown by the fact that where a peripheral sense organ is diseased, a corresponding area of the brain remains permanently undeveloped; whilst if communication with the outside world is closed *vid* several sensory pathways, the growth of the brain cells may be so much interfered with as to produce a condition almost amounting to idiocy, and known as "amentia by sense deprivation." The cases of Kaspar Hauser, Laura Bridgman, and others, which will be referred to in a subsequent chapter, are celebrated instances of such a condition. The deprivation of sensory stimuli may not only arrest the growth of that portion of the brain cortex in which lies the receiving station, but may also lead indirectly to the non-development of other portions which are functionally correlated. In short, we shall not be wrong in saying that the stimulus of sensory impressions is just as necessary to mental development as are the rays of the sun to the growth and maturation of plant-life.

There are three anatomical structures concerned in sensation—a peripheral sense organ, a transmitting nerve, and a central receiving station. The chief peripheral organs are those of eye, ear, nose, mouth, and skin; but impressions are also transmitted from muscles, tendons, joints, and internal organs. The stations at which these various impressions are received are not in every instance known; but probably the majority go to some portion or other of the brain cortex. It seems probable, however, that before these impulses can rise into consciousness, they must be conveyed by another relay of nerve fibres to a higher centre, possibly situated in the prefrontal or parietal regions, so that the integrity of this latter system is essential to the *consciousness* of these impressions. In some cases defects of sensation are due to imperfections of the lower sensory pathway, and it is then usually the peripheral organ which is at fault. In most cases, however, it seems likely that the defective sensation of aments is the result of the imperfect development of the upper pathway—that it is, in fact, mental rather than sensory proper; it is, nevertheless, more convenient to refer to all anomalies of sensation, however caused, under the present heading.

It is sometimes stated that at birth the child can neither hear, see, nor feel; but this is by no means the case, and it is stated by Peterson,* as the result of a collective investigation into the mental status of 1,060 new-born children in the lying-in hospital of the city of New York, that most infants (even when prematurely born) were sensible to light and sound, that they reacted to salt, bitter, sweet, and sour substances placed upon the tongue, and that they had cutaneous sensibility to touch and temperature, and manifested signs of discomfort during the first day of life.

We may now consider the various sensory anomalies of aments in detail.

Taste.—The senses of taste and smell are very closely related, and are the first to make their appearance in the normal child. If the tongue of a child of one or two days old be wetted with a solution of sugar, his face will usually indicate every appearance of contentment, and he will often make sucking movements. If, however, the tongue be wetted with a solution of quinine or of tartaric acid, he will usually scream, choke, and show other signs of repulsion. Whether the child is conscious of these differences is a question difficult to answer, but the reaction which occurs plainly

* F. Peterson, *Journal of Nervous and Mental Disease*, February, 1912.

shows that not only are the sensory pathways open to the receptive centre in the brain cortex, but that a connexion also exists between these centres and the motor area. In normal adults the sense of taste differs very considerably. This is probably chiefly due to the extent to which it has been cultivated, and in professional tea and wine tasters it reaches a very high degree of acuteness.

In the milder aments there is not usually any marked impairment of this sense, although I doubt whether they have the delicacy of taste of an ordinary person. They have their likes and dislikes with regard to food, and they appreciate sweets and object to nasty medicines. In the more severe grades there is often an extreme defect of taste, whilst in many cases there is marked perversion of this sense. Thus, some idiots will munch sugar, quinine, or even soap, quite indifferently, and without the slightest indication that they distinguish one from the other. Others will eat and drink anything which comes within their reach, including wood, leather, grass, earth, stones, even urine and fæcal matter, or offal of the most putrid description.

It is stated by Thiemich* that even as babies the taste of imbeciles is often distinctly defective. One of the chief characteristics of Mongolian amentia is a large fissured tongue, with hypertrophied papillæ, but this does not appear to be accompanied by any particular anomaly of taste.

Smell.—It is stated by Preyer† that the normal child is probably able to distinguish between the smell of the mother's milk and that of the cow as early as one day after birth. It is quite certain that at a very early age he shows a marked difference of reaction when agreeable and disagreeable odours are placed under his nose, and long before he is a year old he will often evince a distinct liking for particular smells. I know of no inquiries which have been made upon the condition of aments in early infancy. At a later age those of mild degree are able to perceive most odours, but the sense is usually lacking in delicacy. In the more severe grades there often seems to be a complete absence of the sense. Many idiots will smell the most filthy compounds without the slightest sign of repugnance, and some will sniff strong ammonia without any reflex movement. In these latter a defective condition of the olfactory mucous membrane would appear to be present.

* Thiemich, *Deutsche Med. Wochenschr.*, vol. xxvi., 1900, p. 34.

† W. Preyer, "Mental Development in the Child," 1901.

Vision.—Sensibility to light is usually present in the normal child at birth, as shown by the contraction of the pupil to a bright light. Moreover, if a strong light be directed on to the open eye, there will be a rapid reflex shutting of the lids; and if this does not occur, the presence of some abnormality of eye or nervous system is to be apprehended. By the time the child is a few days old its eyes will usually turn to follow a lighted candle. Some perception of objects would appear to be developed within the second or third months, although it is probably not until much later that any details are perceived and the course of visual perception is from the gross to the minute. The sense of colour does not appear until considerably later, but some experiments that I made upon an intelligent child of eighteen months showed unmistakable ability to differentiate between red, green, blue, and yellow.

In the milder degrees of amentia visual defects consist chiefly in an inability to discriminate between the slighter differences of form, size, or colour. An octagonal will be confused with a hexagonal figure; no difference will be noticed between the size of a florin and half-crown; and although these patients may differentiate between the primary colours, they are often unable to detect differences of shade. As we proceed down the scale of amentia, these defects become more marked, until in the severe forms of idiocy they exist to a very pronounced extent. The colour perception of the low-grade imbecile and idiot often seems limited to the recognition of red, and it is interesting to note that this is the colour which is usually most attractive to, and first recognized by, the normal child. The appreciation of form and size by idiots is very imperfect, and although they will distinguish between a child and a grown-up person, and between a man and a woman, many of them are incapable of any more delicate differentiation. Voisin states that in most imbeciles the perception of relief is wanting. The chief peripheral defects have already been described; they are strabismus, corneal ulcers and opacities, cataract, astigmatism, hypermetropia and, less frequently, myopia. A few low-grade aments are congenitally blind, but colour-blindness does not appear to be commoner than in normal persons. These conditions, and, indeed, all anomalies of the end organs of special sense, are more frequent in the severer grades of mental deficiency.

Hearing.—The undeveloped condition of the auditory tympanum and ossicles at birth preclude the transmission of sounds, and

consequently the new-born child is deaf. The sense of hearing is developed very slowly, and it is usually not until the fourth or fifth month of life that the child shows indications that it recognizes the voices of its parents.

In aments developmental anomalies of the external ear are very numerous, but it is very rarely that such interfere with hearing. Where there is a peripheral cause for deficiency of this sense, it is nearly always of inflammatory origin and situate in the middle ear. Otorrhœa occurs with considerable frequency in aments of all grades. Apart from such causes complete deafness is not common in the mentally defective. Some idiots and imbeciles will pay not the slightest regard to questions, to the sound of a whistle, or noises of many kinds, and they are on that account often thought to be deaf. That this is due to want of interest and attention, however, and not to deafness, is often shown by the fact that they will at once turn upon the rattle of a spoon and plate. Itard's wild boy of Aveyron was unresponsive to many sounds, and yet he showed a marvellous aptitude for hearing those in which he was interested. In the feeble-minded grade of amentia there is not usually any marked deficiency of this sense, although hearing, as a rule, is neither so acute nor are the finer differences of tone so well detected as by the normal person.

Cutaneous Sense.—By means of the various specialized nerve corpuscles and end bulbs in the skin, with the nerve fibres passing therefrom, we receive impressions of touch or pressure, pain (which is a special variety of touch), and temperature. Peterson is of the opinion that all these senses exist in the normal child from the first day of life, but my experience is that the new-born child is not nearly so responsive to such stimuli as he is to those of taste. I have often failed to obtain any reaction to a moderate pin-prick in different parts of the body; the child may be pinched without showing any movement; and it is often some weeks after birth before he evinces disapproval if the bath is too hot or too cold. From this early age cutaneous sensibility gradually becomes more marked, and by the time the child is a few months old it will show an unmistakable response to different kinds of contact, to painful impressions, and to alterations of temperature. In the normal adult the degree of sensibility to these stimuli naturally varies within very wide limits. There would also appear to be physiological differences dependent upon sex, as well as sociological differences,

probably dependent upon education and mode of life. It is probable that the same holds good in aments, and hence one can only give certain broad statements of them as a whole.

It occasionally happens that the sense of *touch* is extraordinarily delicate, instances of which will be given in treating of Idiots Savants. As a rule, however, although the milder aments can differentiate between substances which are hard or soft, rough or smooth, they cannot appreciate the finer gradations of these qualities so well as can the normal child. In the imbeciles this sense of discrimination is still less acute, whilst in the idiots such a test is practically impossible. Alterations of *temperature* are certainly appreciated by the mild aments, although here also sensibility would seem to be less acute than in the normal. In the lower grades this capacity seems to be wanting, and such will sit in front of the hottest fire, under the most blazing sun, or exposed to the coldest wintry blast, without showing any concern. *Pain* is experienced by feeble-minded children; they will complain of headache, tooth-ache, or stomach-ache; but here again it is exceedingly doubtful whether they have the same appreciation as has the normal child, and many feeble-minded persons will suffer the extraction of teeth and other operations of minor surgery with relatively little concern. In imbeciles, and to a still greater extent in idiots, inability to feel pain is often a very marked characteristic. Many of these persons will knock themselves against floor and walls, poke their fingers into their eyes, pull out their hair, teeth, or toe-nails, and injure themselves severely in many ways, without showing the slightest indication that the process is painful. I knew a boy some years ago who had such an incurable habit of sucking his finger that the bone had been completely denuded of flesh, yet the practice seemed to afford him extreme pleasure rather than discomfort.

Sensations from Muscles, Tendons, and Joints are chiefly of use in enabling us to appreciate the weight, size, and position of objects. Such impressions also play a very important part in determining the quantity and quality of muscular contractions, and are therefore essential to the maintenance of the equilibrium of the body, to walking, running, jumping, and, indeed, to any action requiring muscular co-ordination. It seems likely that in the normal infant sensations of this order are very poorly developed at birth, and that they owe most of their development to practice; certainly, as a

result of this, co-ordination may reach a very high degree of perfection, as is well seen in the performance of such delicate manipulations as violin and piano playing, and the like.

It occasionally happens that the feeble-minded evince a very high degree of manipulative skill in certain directions, and in such cases it is clear that impressions of the kind we are now considering must be quite equal, if not superior, to those in ordinary persons. This, however, is exceptional, and if the mentally defective child be asked to compare the weights of small pill-boxes filled with a varying number of coins or shot, by placing them on the palm of his hand, he will usually be found distinctly inferior to the normal. In the lower grades of defects such a test is impossible, but, judging from their general clumsiness of manipulation, body balance, and movement, it would appear that such impressions cannot be of a very high order.

Under the term **Organic Sensations** we may include not only afferent impressions from the internal organs, but also such sensations as those of thirst, hunger, and the sexual instincts. In the mildest cases of amentia there would not appear to be any marked abnormality in these respects. Feeble-minded persons feel the pangs of hunger and thirst, are conscious of bodily aches and pains and general discomfort, and have sexual desires; sometimes, indeed, these latter are inordinately developed. Nevertheless, on the whole, I am disposed to think that their feelings in these respects as a rule are not so keen as in the non-defective individual. In the more severe grades of amentia defects of organic sensation become more pronounced. The painful sensations which accompany disease are often not appreciated, and these persons will be acutely ill with alveolar abscess, pneumonia, gangrene of the lung, or tuberculosis, without making any complaint. In the profound idiots such primitive organic sensations as those of hunger and thirst are wanting, and such persons would die of starvation if not fed. It often happens that these cases show an absence of the instinct of sucking from birth. On the other hand, many of the less pronounced idiots are extraordinarily gluttonous, and will voraciously devour almost anything coming within their reach.

CEREBRATION.

All impressions reaching the brain by the various sensory pathways we have just described tend to be converted into action, and in some instances action takes place as an immediate response without any consciousness of the incoming sensation. Usually, however, the transference is not thus simple. Between the sensation and the motor response there are interposed a variety of processes of the utmost complexity, the nature and *modus operandi* of which are far from being understood. Probably many reflex movements are even accompanied by complex processes of this kind, which, although subconscious at the time, may subsequently rise into consciousness. These internal processes are commonly termed "psychological" as opposed to "physiological"; but there can be no doubt that they have as their concomitants definite physiological states of the brain; that they are, moreover, dependent upon anatomical peculiarities of brain structure, so that the differentiation is probably only a verbal one. It is these internal processes, which comprise what may be termed the "cerebration" of the individual, that we have now to consider.

Perception.—It is probable that the first of these processes to come into being in the child is that of perception. The various sensory receptive stations are connected by relays of nerve fibres with a higher level station, and into this the afferent vibrations pass to be combined and to rise into consciousness as a perception. It seems doubtful whether we can ever be conscious of a simple sensation as such: the blueness of the sea or sky is always associated with other attributes, smells invariably give rise to compound images, and the consciousness of an impression from the skin is made up of other sensations than those of mere touch. The presence of an intricate system of association fibres causes all sensations simultaneously experienced to "cling together," and hence the consciousness of an object is always a compound mental picture; these associates being recalled upon the presentment of any of the elementary vibrations which go to the make-up of the composite whole. Amongst the most important of these afferent vibrations are those which serve to relate the object in time and space, and a perception may be said to be a cognition of various associated sensations thus related aroused by stimulation from the actual object without. Sensations become conscious perceptions as a

necessary result of the development of certain brain pathways, and every normal brain is endowed with the faculty of thus forming perceptions. It seems probable, indeed, that some form of conscious perception is present in all life forms, even in the protista, although the quality and quantity of perception will necessarily vary with the complexity of cerebral development. It will be obvious, therefore, that the nature of a person's perceptions must be primarily dependent upon the integrity of his sensory apparatus, and where this latter is faulty, consciousness must be similarly incomplete. But this is not all. Everyone is familiar with the imperfect, misty consciousness of passing objects which occurs when the thoughts are otherwise occupied. For instance, during the reading of an interesting book, extraneous objects may be presented to our senses, a bell may ring, or a person come into the room and go away again without our "taking in" who it is. And yet there is no defect of sensation; impressions of sight and sound have travelled to the brain, and may subsequently flash into consciousness to form a vivid mental picture of what has happened, but for the time being they are unnoticed, for the reason that our attention is focussed elsewhere. This subject of attention will be considered immediately, but it is clear that other processes than those concerned in mere sensation are necessary for accurate perception, and I am inclined to think that the imperfect perceptions of aments, their lack of acuteness and feeble intensity, are in most cases more due to imperfect attention or other defect of cerebration than to imperfection of sensation proper. It is to such defects of perception that their inability to discriminate the finer qualities of objects is due.

Attention.—The act of attention consists in the focussing of consciousness upon a perception or idea, to the exclusion of other ideas. It may be *spontaneous and involuntary* or *active and voluntary*, and it is necessary to consider these separately.

Spontaneous attention occurs when a perception or idea is so sudden, so intense, or so unusual, that it holds consciousness automatically and without any mental effort. Of this nature is the flash of lightning, the peal of thunder, or any sight or other sensation to which the beholder is utterly unaccustomed. This form of attention is characteristic of children and the lower animals, and although, of course, dependent upon the nature of the stimulus, variations in it are more influenced by the condition of the cerebral

cells with regard to their inherent excitability. It may be compared to the violent shock inflicted upon the cerebral mass of the child of a few weeks old by any sudden noise, and which results in a general start of the whole body; with the development of consciousness this general bodily change is often still seen when attention is involuntarily aroused.

In the lowest types of idiocy feeling is very rudimentary, and hence even this spontaneous form of attention is defective. But even where perception is present the cerebral excitability may be so diminished as to bring about a considerable deficiency of spontaneous attention, and this is the case with many idiots and imbeciles as well as with a few feeble-minded. Such persons are dull and lethargic; they seem to be utterly unconcerned by anything happening around them, and they have no curiosity or initiative. If in school, they sit at their desks gazing vacantly in front of them; if in the playground, they stand aloof in a corner, without the slightest desire to take part in the games of their companions. They respond tardily, or not at all, when addressed, are stolidly indifferent when interfered with, and are, in fact, so generally inert as to give rise to the impression that they are deaf. But there is no real sensory defect, and the condition is simply one of general brain inertia. By appropriate methods of training, the excitability of the brain cells may often be increased and the child aroused out of his lethargy.

Active or voluntary attention takes place when the idea or sensation attended to has no compelling power of its own. Attention to it may, indeed, be distasteful, and the focussing of consciousness upon it, so that other ideas and impressions are for the time being shut out, demands a very considerable effort of volition. It is plain that attention of this kind is indispensable to the acquirement of knowledge and the conduct of human affairs, and the person in whom it is greatly lacking will cut but a sorry figure in life. Its defect is called "aprosexia."

Defect of voluntary attention is present in a large number of aments. They are quite incapable of concentrating their thoughts upon a particular subject, and they consequently have no power for sustained work. It follows that their education and training is exceedingly difficult. Persons of this type differ from those lacking in spontaneous attention in several noteworthy points. Instead of being heavy and lethargic, they are often active and restless, and

attracted, but distracted, by every sight and sound around them. The clinical signs are thus the exact opposite of the former type, and at first sight would appear to result from an excessive, instead of diminished, nervous excitability. This, however, is by no means necessarily the case, and very often the fault seems to lie rather in a defective power of co-ordination and control. It is often associated with the presence of tricks and habits. As Maudsley says, "The person who is unable to control his own muscles is incapable of attention."

This condition of imperfect muscular control and defective attention is, of course, characteristic of normal infancy; but whereas it is but a phase in the development of the healthy child, it is a much more persistent, and often permanent, condition in the mentally defective. It is undoubtedly responsible for much of the faulty perception and discrimination of these persons, and since our stock of ideas is dependent upon the multiplicity and accuracy of sensations from the outer world, some would see in this defective power of attention the psychological *fons et origo* of mental deficiency. But whilst admitting to this faculty a most important share in the quantity and quality of the intellectual processes, its lack in these persons is not sufficient to account for their imperfect reason and want of common sense. Moreover, there are many aments in whom attention is not lacking. We must therefore consider the defective attention of aments, not as the prime cause, but as only one factor of that general imperfection of mental faculty which constitutes amentia.

Association.—I have already alluded to the process of association in speaking of perception. Its physical basis probably lies in the systems of horizontally crossing fibres which will be seen figured in Plate I., and which serve to connect together the various cell layers of the cerebral cortex. It has already been remarked that there is a numerical deficiency of these fibres in cases of amentia and dementia. Whether in aments such paucity is a primary deficiency, or whether it is a secondary result of other causes—such, for instance, as a defective attention leading to imperfect perception and consequently under-development of the association pathways—must be a moot point; but there can be little doubt that the degree of development of these fibres bears a direct relation to the mental capacity of the individual, and that the wealth of associations present in any person is a factor of the utmost importance in

determining his intellectual status. This will be seen more clearly when we come to consider the acts of ideation and reasoning. If a healthy, intelligent child of between three and four years be asked to describe, from memory, some common object—such, for instance, as a cat, a chair, or table—and if a little direction be given to his thoughts by not too leading questions, a very good estimate will be formed as to his capacity of memory and association. To those unacquainted with the mind of an intelligent child of this age the result is often surprising, and contrasts in an extremely marked manner with a similar examination of the mentally defective child of much greater age. I have often found the mental images in a defective child of twelve or even fourteen years to be far simpler, and to have only a fraction of the associations which are present in the former case. In the lower aments the deficiency is still more marked, although such an examination in their case is extremely difficult. Other methods by which the extent of association in mild aments may be tested are those known as the "part-wholes," "genus-species," and "opposites" tests, which together with other mental tests will be described in Chapter XVII. By all of these it may be shown that the mentally defective are distinctly inferior to the non-defective class. Miss Norsworthy,* who has conducted a large number of observations upon mentally deficient children in America, finds that in the first two of these tests only 9 per cent. of feeble-minded children reached that degree of efficiency which was attained by one-half of the normal children, and in the third test none of them reached this standard.

Memory is a process which is similarly indispensable to ideation and reasoning. It is obviously also essential in the practical performance of even the simple affairs of everyday life. The process of memory consists of two factors—namely, *retention* and *recall*. Recall is dependent upon association, since the larger the number of links possessed by the particular fact experienced, the greater will be the ease with which it can be drawn up to the surface of consciousness when it is again required. It follows that a good general memory and wealth of association go hand in hand. Ease of recall is also dependent upon the degree of retentiveness or "perseveration." The conditions which cause an impression to be "retained" are not fully understood, but they are probably partly the physio-

* N. Norsworthy, "The Psychology of Mentally Deficient Children," New York, 1906.

logical constitution of the brain cells, partly the intensity of the sensation experienced, and partly the degree of attention exerted. Thus, as is well known, occurrences which are unusual, particularly striking, or upon which the attention has been strongly concentrated, tend to be more easily and longer retained (or, in other words, more readily recalled) than those of everyday occurrence, or to which no particular thought has been given. It is as if, under such conditions, a deeper channel had been worn, which more readily permits of the return flow which takes place in the act of recollecting. From this it follows that association and attention are the chief factors involved in memory.

It is in agreement with their defective association that we find the general power of memory of aments to be decidedly below the normal. If an ament and a normal child be each given a number of tasks to perform of a quite simple nature, the failing of the former will usually be very apparent, in that he will almost certainly forget a quarter or half of them. Over and over again parents will say that if their feeble-minded child be sent on three errands, he will forget one or two of them, and I have tested this myself on many occasions. Galton, testing the memory of imbeciles by means of a series of haphazard numerals, found that few of them could repeat more than four, a number greatly inferior to those of which a normal child is capable. Miss Norsworthy, using the tests of related and unrelated words, found that only 5 per cent. of feeble-minded children came up to the average of the normal; and F. Smedley found that the incorrigible, defective, and truant boys of the John Worthy School (U.S.A.) were decidedly lower in memory power than the pupils of normal schools, and that the disparity was increasingly marked at the higher ages. As will be described in a subsequent chapter, some aments are characterized by a really remarkable power of repeating poetry, remembering names and dates, and other similar feats of memory, and in not a few aments the tenacity of memory for striking events and certain isolated occurrences which have appealed to them does not seem to be markedly inferior to that of the normal person. But such memory is particular rather than general; it seems to be due to the fact that spontaneous or active attention have resulted in the formation of such a facile nervous pathway that recall is easy, and in the majority of those cases which even evince phenomenal memory in certain directions their general power of recall is decidedly poor. I know

a man of this kind who will reel off facts of ancient history literally by the yard, but he finds considerable difficulty in saying what he had for breakfast, or what were the happenings of yesterday.

Ideation, Imagination, Thought.—An idea may be said to be a mental image of a thing not actually present to the senses. It is, in fact, a picture brought into consciousness, not by a direct sensory stimulus from without, but by stimulation from within. Ideas differ from perceptions, therefore, merely in the physiological manner of their production.

If ideas follow one another simply as a result of associative recall—that is, if each succeeding picture arises into consciousness merely in consequence of the haphazard stimulation by elements of the one which has preceded it—we have that condition of fantasy, reverie, or day-dreaming, which is so familiar. If, by an effort of attention, the stream of ideas is kept within a particular channel, so that the series has a willed relationship, we may describe it as thought. It follows, therefore, that all the processes we have hitherto considered—namely, sensation, perception, association, attention, and memory—are necessary for the formation of ideas; and, generally speaking, that form of ideation known as "reverie" or "imagination" is dependent upon a complexity plus a nimbleness or facility of association; whilst that of thought requires that good association shall be accompanied by a considerable power of attention.

This being the case, in view of the defects of these processes which have been described as present in aments, it is not surprising to find that ideation is of a very imperfect character. Fantasy, reverie, and day-dreaming occur in some of the milder aments, although in a much simpler form than in the normal person. Moreover, many of those of unstable type have delusions without either mental exaltation or depression. A few are even capable of certain amount of constructive imagination, as is shown by their skill in drawing and mechanical invention, as well as by the cunning with which they commit thefts and the ingenuity with which they invent plausible lies to screen themselves and incriminate their companions. On the whole, however, there seems to be a decided defect in the faculty of imagination in aments. The higher types may copy a drawing or design; they may produce faithful models of flowers or fruit; they may, indeed, have a very high degree of manipulative skill; but their work is generally a slavish imitation,

and they hardly ever originate. And when they do, the result is not usually creditable to their imagination. If mentally defective school-children be watched drawing, brick-building, or pattern-making, it will generally be found that they follow the same stereotyped plan, and that they do not evince a fraction of the originality shown by the normal child. In the imbeciles and idiots the deficiency is much more pronounced.

It necessarily follows also that the capacity of aments for consecutive thought is extremely limited, whilst conversation readily reveals the general crudity and childishness of their ideas. One may indeed say that the intellectual life of these persons consists almost entirely of perceptions, and not conceptions—that is, of simple ideas relating to objects which are immediately present to their senses. I cannot agree, however, with the statement so often made, that the ament is utterly wanting in the capacity for forming abstract ideas. It is true that the concrete is much more readily grasped than the abstract, and it is interesting to note that many feeble-minded school-children find it much easier to express their ideas by means of a drawing than by a word; but there is no doubt that many of the milder grade are quite capable of conceiving such universals as mankind and womankind, goodness and badness, and the like. Of abstracting in the logical sense, however, most of them are probably quite incapable.

Judgment and Reasoning.—To reason is to think, but thinking is not reasoning. Most of our thinking consists simply of a review of mental images, which successively rise into consciousness in accordance with the laws governing association. The thought which is past has suggested that now present, and this in its turn suggests that to come, the series depending upon previous experience (perceptions) and the type of our mental constitution. Thinking is thus to a great extent a form of reverie, although thoughts may be directed and confined to a certain channel by an effort of will.

Reasoning, on the other hand, necessitates not only a definite and deliberate effort of mind, but it also involves other processes which are not concerned in mere thinking. Without attempting to discuss what these are, or the manner of their working, it may briefly be said that reasoning consists in, firstly, the deliberate contemplation of certain ideas; the abstraction from these of their essential attributes; the comparison of these abstractions; and,

finally, the construction of an idea or judgment which is new to our mental experience.

It is commonly stated that language is necessary for reasoning, but this depends upon the precise meaning we attach to the term "reasoning." For the higher forms of abstract reasoning a docketing process by means of words is clearly essential, but there is not the slightest doubt that reasoning in a . sense may take place without this. There are many persons gifted with an extraordinary flow of language who yet possess little reason; on the other hand, it is quite clear that both the word-deaf and the child who has not yet acquired the faculty of speech are capable of this power. The presence of reasoning may be seen in a hundred ways in the normal child from the sixth month of life, and, as has been well pointed out by Preyer, it undergoes a great development through the influence of play. By means of this the normal child is led to make mental comparisons, to draw deductions from those comparisons, and hence to evolve thoughts entirely new to his previous experience. There can be no doubt that sensation, perception, discrimination, attention, and reason, are largely developed by a child's spontaneous play. The child of a few months will at first get very angry because it cannot succeed in putting a big toy through a hole which is much too small for it, but long before it has learned to speak it has developed the sense to see the impossibility of the attempt. During its first year of life an intelligent child who wishes to climb into a chair which is too high will accomplish its purpose by scrambling up from a footstool, which it has placed in position from another part of the room. But the mentally defective child of much greater age cannot do this, for such reasoning involves mental activities of a higher order than he possesses.

I regard the chief characteristic of amentia as a defect of this capacity. This defect reaches its maximum in the most pronounced degree of amentia, and in the majority of idiots the ability to reason is completely absent. The absolute idiots would even die of starvation in the midst of food, if they were not fed. The imbeciles possess some capacity for reasoning, although of a very simple order; whilst in the feeble-minded grade the defect is still less evident. A feeble-minded child who is ignorant of money values, if offered the choice of a shilling or half-crown, may choose the latter "*because it is bigger.*" Some defect, however, is present in every grade of amentia; and if I were compelled to specify which

particular mental abnormality was chiefly responsible for the maladjustment of their conduct, I should certainly say it was the one we are now considering.

I sent a feeble-minded and an imbecile youth respectively to fetch an article out of a room, the door of which had been locked and the key hung up in a conspicuous place above the handle. The feeble-minded one went to the door, tried the handle, found it locked, seemed nonplussed for a moment, then saw and took down the key, opened the door, and performed his task. The imbecile tried the door, gazed vacantly at the key, turned round, and said, "Locked." Upon being asked where the key was, he pointed, and said, "There," but when again told what to fetch he made no effort to use the key. Upon my placing the key in the lock, he turned it, opened the door, and got the desired article. A somewhat similar test was tried between two other children. It was a pouring wet day, and I placed an umbrella near the door, and told them to fetch a certain flower out of the garden. The feeble-minded child opened the door, saw the rain coming down in torrents, and, after a pause, picked up and opened the umbrella. The imbecile would have got wet through had he not been called back, but, when given the umbrella, had enough sense to open it before going out.

But although there are many mild defectives capable of such simple reasoning as these feeble-minded children, and many who can not only work well, but can actually earn a living wage, that wage is never equal to what could be earned by a normal person of similar age. I know many feeble-minded adults who are regularly employed. They are careful, industrious, and thoroughly trustworthy, but the work they are capable of and the money they can earn is only equivalent to that of a boy or girl of school age, and this for the reason that they have not sufficient intelligence to cope with any situation needing judgment, or do any work which is not of a strictly routine character. Moreover, they find it impossible to lay out the money they earn so as to provide themselves with the necessities of life, and in the absence of some supervision and kindly control they would rapidly come to hopeless want.

Volition.—The psychological state which we term "will," "determination," or "purpose," is easier of appreciation than of description, and it is plain that it plays a very important part in the regulation of conduct. Will, indeed, is inseparable from action, and in order to understand its nature it is necessary to allude to

the chief forms of movement. As will be more fully shown presently, the earliest movements of the new-born child are of three kinds—namely, instinctive, reflex, and spontaneous. With the development of consciousness, however, the child acquires the power of forming mental images, and when this image is of a movement, it is spoken of as a motor idea. Every voluntary act must be preceded by a motor idea of the act to be performed. The first willed movements are usually noticed in a healthy child during the third month. At this age it will smack its lips and suck its tongue at the sight of the breast or bottle; it will smile at relatives whom it knows, but not at strangers; and it will turn its head to follow the movements of a person about the room. These actions are neither instinctive nor reflex, but are plainly the result of intention and will, and they are each preceded by a mental image of the movement which the child desires to make. With the establishment of such motor ideas manifestations of will become increasingly frequent, and I have seen a child of eight and a half months, whilst being given water with a spoon from a glass, seize the glass in his hands, carry it to his mouth, and drink with great delight. By the twelfth month it is obvious that the intelligent child has very definite ideas as to what it wants to do, and a few months later, when he is beginning to toddle and has command of a few words, he is capable of an amount of will power in his endeavours to put his motor ideas into execution which may tax the energy of his nurse in no inconsiderable degree.

We see, therefore, that the act of willing is dependent upon the presence of a motor idea of some particular action; consequently the faculty for ideation is a pre-requisite to will. But before such idea can become translated into action, it must attain a certain dominance, and we may regard what is usually spoken of as "strong will" as neither more nor less than the fixity with which an idea can be kept before consciousness to the exclusion of other ideas of a possibly neutralizing tendency. Differences in this respect may be due to the physiological constitution of the brain. But it may happen, and often does, that the idea would tend to action which is painful, distasteful, and disadvantageous to the individual. Its dominance and consequent effectiveness can then only be secured when it is reinforced by other ideas, such, for instance, as those of duty, honour, or future (as opposed to present) advantage. Such reinforcement necessitates the effort of attention, and

hence attention plays an important part in the process of volition.

It is often assumed that intensity or violence of action is synonymous with strength of will, but this is by no means the case. Such action, it is true, often results from the presence of a very vivid motor idea, but the response is so immediate as to be more in the nature of an uncontrolled reflex than a real volitional movement, and strength of will is much more evidenced by the extent to which such vivid ideas can be inhibited, and their tendency to action delayed or averted, than by their immediate translation into violent movement. In other words, inhibition is more indicative of a strong will than is initiation. Or strength of will is more manifest by sustained conduct in a particular direction and towards a definite end than by the immediate and, it may be, violent response to the feelings and emotions of the moment. Such inhibition must be regarded as due to the degree of attention which can be brought to bear upon ideas of an opposing nature until they acquire sufficient dominance to neutralize the original incentive to action. If this latter is of an antisocial or immoral nature, the result is a great moral victory, and the state of mind which occurs whilst the battle is being fought has been utilized as subject-matter by many novelists. It may be stated that the performance of the act gives rise to an emotional state which is either pleasant or unpleasant, the memory of which may serve to reinforce or neutralize a similar motor idea when it is again presented to consciousness. In this way, by bitter experience, the child learns to inhibit action, and so develops control and strength of will.

Perhaps these remarks may help us to understand better the varieties of defective will which occur in aments. Such a defect is exceedingly common, and I think that, on the whole, what is usually called the weakness of will of these persons may, for purposes of description at any rate, be divided into two categories, according as it is chiefly dependent upon a paucity of ideas or a faulty power of attention. Thus a section of mentally defective persons are placid, stolid, inert individuals, who seem, as their friends sometimes say, "to have no minds of their own," and who are quite content, even when they are grown up men earning a regular wage, to take their money home to their mothers, and receive in exchange an occasional penny as pocket-money. The defect here seems to be principally one of general brain inertia, conse-

quence of which motor ideation does not attain the dominance necessary for action.

Another example of weakness of will is seen in those feeble-minded girls who are readily amenable to the sexual suggestions of any man they may chance to meet, and who, in the absence of supervision, almost inevitably embark upon a life of immorality and petty crime. There is here no defect of motor ideation, and no inability to recognize that their acts are such as would not find favour with their relatives and friends; but ideation from internal stimuli is weak, and that from external stimuli more ready, there is a defect of attention, and no power for mental effort, and consequently a complete inability to withstand the temptation of the moment and consistently to follow a right course of action. Another example of weak will is seen in the intractable, emotional, and explosive type of ament, which will be described in the chapter dealing with mentally deficient criminals. In these also the condition seems to be largely due to a defect of attention, possibly conjoined with an excessive instability of lower-level brain cells.

Temperament.—Since the days of Aristotle it has been customary to describe four temperaments—namely: **Choleric,** where the *excitability* is great and *after-effect* great; **sanguine,** where the *excitability* is great and the *after-effect* small; **phlegmatic,** where the *excitability* is small and *after-effect* small; **melancholic,** where the *excitability* is small and *after-effect* great. These differences are dependent upon physiological peculiarities of nerve action, and the mentally defective person is subject to physiological differences in the same way as the normal, although some types are much more frequent than others. In general, it may be said that aments are rarely of the choleric type; in those in whom there is great initial excitability the effect is usually transient, so that they come within the sanguine group. Many are phlegmatic, and a few—chiefly of the feeble-minded grade—are melancholic in their temperamental reaction.

Although most aments will display a childish, and at times keen, interest in spectacular displays, they are not as a rule aroused thereby to the same pitch of enthusiasm as a normal child. Moreover, the impression quickly fades, and they soon cease to talk about it. Although by no means insensible to praise or blame, pleasure or punishment, they are not as a rule greatly affected thereby, and the sensation is but fleeting. Some of the milder

grades, it is true, evince a considerable amount of mental perturbation on first leaving their friends for the care of strangers; but they are seldom really home-sick, as is the ordinary child, and they rapidly settle down to their new surroundings with hardly a thought of the old. Of most of them it may be said that their general attitude is one of placid indifference, and that they are decidedly less affected by the happenings of life than are ordinary people.

A few may be described as sanguine. They are quick, lively, and readily attracted by anything happening around them, and easily moved to laughter or tears, passionate anger, or cloudy sullenness. But this state is very fleeting, and leads to little result. Though seemingly full of interest in everything, they settle down to nothing. Another small proportion belong to the melancholic type. In these, although censure, punishment, or neglect seem to make little impression at the time, the child or adult becomes morose, and begins to brood over his real or fancied wrongs. Sometimes a state of true melancholia results, and I have known several persons of this type who have attempted suicide.

Emotion.—It seems probable that every sensation is accompanied by an affective tone or "feeling," which, generally speaking, is of a pleasant or unpleasant nature according as the sensation tends to be conservative or inimical to the individual or race. With the development of ideation, however, simple feelings of this kind acquire a much more complex character, and constitute those affective brain states with which we are all familiar, and which are termed "emotions." The number of them is practically endless, embracing as they do such as fear, anger, disgust, hate, contempt, joy, gratitude, contentment, hope, sorrow, despair, resignation, horror, envy, jealousy, regret, misery, pride, shame, together with hunger, acquisitiveness, philoprogenitiveness, and very many others.

Without going into the vexed psychological question as to which comes first—that is, as to whether the emotion precedes the expression of it or the expression itself gives rise to the emotion—there can be no doubt that the capacity for experiencing the various emotions is inseparably bound up with the capacity for ideation, and hence where this latter is defective, as in aments, the varieties of emotion experienced will be similarly defective in both quantity and quality. As the old adage has it, "Where there is little sense, there is little feeling," and we find that the capacity for experiencing

emotion in these persons is usually proportionate to the amount of general intelligence present, although something seems to depend upon the particular variety of nervous temperament. In the absolute idiots there seems to be neither feeling nor emotion. Those above this grade seem to be capable of experiencing sensations of hunger, thirst, and the general pleasantness or unpleasantness of their surroundings. Imbeciles are capable of feeling, amongst others, affection, grief, fear, anger, surprise, hate, and possibly envy and jealousy; whilst the feeble-minded show evidence of such more complex emotions as shame, awe, contempt, disgust, indignation, and the like. It is to be remarked, however, that such feelings rarely seem to have the same intensity as they do in normal persons, and that they are usually of more transient duration. In what may be termed the "emotional type" of ament, it seems doubtful whether the range of feeling is at all large, nor is its intensity to be necessarily judged by the violence of action which may accompany it, the chief characteristic being the rapidity with which one variety of feeling gives place to another of, it may be, an exactly opposite character.

Sentiment.—What is termed "sentiment" represents a higher development of the affective state, and it has been neatly defined as "an organized system of emotional dispositions centred about the idea of some object." In the main we may describe four varieties of sentiments or senses—namely, intellectual, æsthetic, moral or social, and religious. The *intellectual* or *logical sense*, which causes us to test each new experience by the light of our previous knowledge, is essentially wanting in aments. The *æsthetic sense*, which connotes an appreciation of beauty as opposed to ugliness, is seldom present to any considerable extent, although it is not infrequently present in a rudimentary form. Some mild aments, however, may possess it to a very extraordinary degree, as is shown by marked musical or artistic talent. The *moral, ethical,* or *social sense* is the faculty of appreciating the obligations due from man to his neighbours as component parts of society, and which causes a person to ask, Is this right or wrong? This sense is, of course, lacking in idiots and imbeciles, and in the feeble-minded it rarely reaches a high degree of development. Most of these persons act upon the impulse of the moment, quite unaffected by any altruistic feelings. They may develop the habit of refraining from lying or pilfering because they realize that such leads to punish-

ment, but the majority do not understand that any obligation is morally due from them, or that they should be virtuous for virtue's sake. At the same time, some certainly do acquire rudimentary ideas of unselfishness and good behaviour. The *religious sense* connotes a feeling of the relationship between God and man. I think the germ of this is often present in the milder aments, and not a few of them develop hazy, anthropomorphic ideas of a Supreme Being. They may be taught, and in a simple way understand, the Bible stories; they may tell one that after death the good people go to heaven and the bad ones to hell, and this belief may be not without effect upon their daily behaviour; but of theological dogma or doctrine beyond this the majority have little or no conception.

ACTION.

All sensations tend to movement, and it is by movement, in some form or other, that the existence of mind is made manifest. Observation of movement, therefore, as occurring in the ordinary contractions of the bodily muscles, in the more complicated mechanism of speech, or in the still more complicated actions by which the individual reacts to his surroundings, known as "behaviour" and "conduct," constitutes the means by which we judge of the quantity and quality of his mind. This relationship has been ably pointed out by Dr. Francis Warner,* and to this author we are indebted for much valuable information regarding anomalies of motor function, or, as he terms them, "abnormal nerve signs," in the mentally defective.

Movement.—The simplest form of movement is, in all probability, the result of explosions within the motor ganglion cells taking place in consequence of their own inherent instability. Such movement is *spontaneous*, and is seen in the spreading of the fingers and toes of the young infant (the "*microkinesis*" of Warner); later, possibly, in the inarticulate babblings and cooings which denote the first activity of the motor cells concerned in speech. Presently, as a result of the laying down of pathways within the cerebral mass, the motor cells acquire two connexions. One of these brings them into relation with the sensory areas of the brain, the other with the higher levels concerned in ideation and volition. As a result of

* Francis Warner, "Anatomy of Movement," "Mental Faculty," and numerous other writings.

the former of these connexions, the simple spontaneous movements become so modified and controlled by the quantity and quality of the incoming sensations as to be perfectly adapted to them. We then have a *co-ordinated* movement, in which an optimum result takes place with a minimum expenditure. When this result has been attained, and a well-worn pathway established between sensory and motor areas, the appropriate movement is readily called forth upon the presentment of its customary stimulus, producing a *reflex co-ordinated* action. Many of the ordinary reflex movements are the result of spinal rather than cerebral action.

The new-born child comes into the world with some of these channels already laid down, so that it is capable of so-called *instinctive* or hereditary movements, such as grasping, sucking, and crying. If an adult's fingers be placed within the grasp of a new-born child, it closes on them so tightly that he can be lifted off the bed without letting go. This is purely instinctive, and passes off a few days after birth.

The second connexion, which links up the motor cells with those portions of the brain concerned with the intellectual processes, brings the motor functions under the influence of the will, and so makes *volitional* action possible. Such action is always preceded by an *idea* of the motion to be performed (motor idea). The nature of this volitional action, however, will be different according as other intellectual associations act as a drag or not upon immediate response. In the simplest and lowest type of mind an immediate response follows the presentment of the idea, and the action is *impulsive*. Such may take place almost with the rapidity of a reflex act; indeed, by constant repetition the motor idea to an action of this kind may be subconscious, and the action truly reflex. On the other hand, the motor idea may call up other associates, so that deliberation intervenes to delay or inhibit the natural tendency to immediate action. After a longer or shorter period of deliberation, in which the pros and cons are carefully passed in review, a choice is made, and finally the highest type of action—a *deliberate, purposeful* manifestation of will—results.

We thus see that in aments various anomalies of movement may occur as a result of their imperfection of development. The metabolism or excitability of the motor ganglion cells may be abnormal, and the *quantity* of movement defective or excessive. Sensations may be imperfect or distorted, or the connexions between sensory

and motor areas faulty, leading to defects in the *quality* of movement or inco-ordination. The connexions between sensory and motor centres which are normally laid down at birth may be lacikng, producing a diminution or absence of the instinctive movements—a condition which is by no means infrequent in idiocy. On the volitional side response may occur immediately upon presentment of the idea, and impulsive action of this kind is very characteristic of many aments. On the other hand, response may be tardy, not because of the intervention of deliberation, but because the cerebral cells generally are lethargic and unexcitable, and the connexion between volitional and motor centres a comparatively untrodden pathway; and this kind of slothful action is characteristic of another type of aments. Finally, anomalies of movement may occur in consequence of gross lesions or disease of the cerebro-spinal axis. We may now consider the chief of these anomalies of the motor functions somewhat more in detail.

Deficient Movement.—In a considerable number of aments movement is deficient in quantity, and this is generally the result of a diminished excitability of the nerve cells. The condition is most common in the severest grade, but it is also seen in the imbeciles and feeble-minded. In the most pronounced cases it is obvious from birth, and the child never cries, sucks, or looks about him like an ordinary child; in the milder forms these instinctive movements are present, but the child is backward in his first attempts at sitting up, standing, and walking, whilst speech is very much delayed. The appearance of such children is usually characteristic; the face wears a dull, heavy, vacuous expression, and there are many indications of want of muscular tone. In the temporal and masseter muscles this often shows itself by dropping of the lower jaw and a persistently open mouth. Continuous slavering is very common in such cases. The general balance of the body is feeble, and when the child walks, he does so with a slothful clumsiness. If told to follow an object with his eyes, he either makes no response or turns his whole head round in a slow and laboured manner. His arms are listlessly extended to command, but the fingers and hands hang flabbily down, and the whole arm very soon drops to the side. His whole appearance and behaviour are indicative of cerebral and spinal inertia.

Excessive Movement.—In another type of aments all movement is in excess, and the condition is one of chattering, ceaseless activity.

This also is noticeable soon after birth, and the remark is often made by the parents that the child "never sleeps." This, of course, is not really the case; for although these children do not have regular long periods of sleep like ordinary children, or even ordinary idiots, there is no doubt that they do have brief but frequent snatches. There is equally no doubt, however, that their sleep is very light and readily disturbed. This condition is the antithesis of the one just described, and is due to hyper-excitability of nervous tissue. For some time after birth it is manifested as an excess of spontaneous movement, but as the motor cells acquire connexions with sensory and ideational areas, this type of movement alters, being replaced by actions of a higher order. Of these there are three chief forms—namely, ideo-motor repetitive actions of subconscious type; ideo-motor repetitive actions of conscious type; and impulsive volitional actions. It is to be remarked that, although these varieties of excessive movement are very common in amentia, they are not characteristic of that condition, but may occur in a merely neurotic child. Most of these forms of excessive movement are accompanied by a diminished capacity for sustained attention, and this is well seen in the restless ament whose attention is so distracted by every sight, sound, or feeling reaching his sensorium that steady continuous work becomes an impossibility.

In a considerable number of aments excessive action is chiefly pronounced in certain groups of muscles, and, by being constantly repeated, the movements acquire an automatic and subconscious character. They are then popularly known as *tricks* or *habits*. The most frequent of these are spasmodic frowning and knitting of the eyebrows (which may be symmetrical or unilateral), grinning, smiling, and grimacing; nodding and shaking of the head; shrugging of one or both shoulders; opening and shutting of the hands, and swaying of the body; biting the nails, sucking the thumb, and many others of like character. The characteristic of these movements is that, at first irregular, they subsequently tend to be repeated at more or less regular intervals, and are particularly marked when the child is in the presence of strangers and conscious that he is being observed; further, unlike the spasmodic, purposeless movements of chorea, they are definite co-ordinated acts. Originally it is probable that many of them had a purpose; for instance, I have sometimes traced the repeated shaking of the head, which is very commonly seen in neurotic children, to the presence of long, strag-

gling hair hanging in front of the eyes. The frequent repetition of the act produces in time a kind of obsession, and this leads to its automatic unconscious performance when the original cause has been removed. In aments it often lasts throughout life.

Closely related to these automatic actions are others of a somewhat higher character, inasmuch as they are always voluntarily performed. Dr. John Thomson* enumerates the chief of these as pica, or dirt-eating, sucking the tongue, thumb, etc., biting the nails, head-rolling, head-banging, rocking and swaying movements of the body, and masturbation. Dr. Thomson says that "the normal act causes little pleasure to the healthy child, whilst its morbid counterpart has an extraordinary fascination for the children who practise it. . . . The essential character which serves at once to distinguish these habits from certain motor neuroses (*e.g.*, spasmus nutans and habit spasm), which some of them superficially resemble, is their *deliberateness*. The child's will is implicated; and what he does is done intentionally—at first, at least—because he likes doing it. They have a strong tendency to occur when the patient is feeling dull and not being interested by his surroundings. They are almost always stopped when the child's attention is taken up with anything that interests him."

Finally, another type of excessive movement is seen in the impulsive volitional actions which are of such frequent occurrence in certain mental defectives. With these persons, an idea is no sooner presented than it is acted upon, quite regardless of right or wrong or possible consequences. Many of them belong to the milder degrees of amentia, and some are by no means unintelligent; but their whole life is actuated, not by intelligence, but by impulse. The essential basis seems to be an undue motor excitability, and the defective deliberation and control allow this to have free play. They comprise the "unstable" type of aments, of whom more will be said in subsequent chapters.

Inco-ordinate Movement.—Co-ordination, in the wide meaning of the term, requires a series of motor explosions which are regular in time, degree, and sequence, as well as in their harmonious adaptation to the various sensory stimuli concerned in the movement performed, particularly those coming from the muscles. It is therefore dependent upon perfectly working sensory, commissural, and motor

* John Thomson. "On Certain So-called 'Bad Habits' in Children," *Archives of Pediatrics*, April, 1907.

mechanisms; but even where these exist, as in the normal child, perfect co-ordination is only attained by constant practice.

In persons suffering from even the mildest degree of amentia, co-ordination is often acquired with difficulty, and remains imperfect; and although many of them may learn to use their hands with a considerable amount of dexterity, the balance and movement of the body often continue clumsy and ungainly. It is frequently years before the mentally defective child manages to lace his boots, button his clothes, or manipulate his spoon at table. Even the best of them (with a few remarkable exceptions) rarely attain to the precision and neatness of movement of which an ordinary well-trained child is capable.

In the lower degrees the defect is still more marked, and many imbeciles experience the greatest difficulty in picking up a pin or a coin, and are incapable of any but the coarsest movements. Dr. Ireland remarks that considerably more imbeciles than normal people are ambidextrous; but I think it is not that both hands are used equally well, but rather equally badly, and I should prefer to say that they were a-dextrous. Many of their defects of speech are due to imperfect muscular co-ordination.

An extremely delicate test of the degree of control over muscular action is afforded by the " transfer " and " imitation " movements of Dr. Warner. In performing imitation movements, the child stands a little distance in front of the observer, who performs a series of extensions, flexions, and other movements with his own arm, forearm, hand, and finally individual digits, each of which the child must imitate as it is performed. In the transfer movements the child stands with closed eyes and extended hands. The observer then performs passive movements upon the digits, etc., of one limb of the child, who is required to make corresponding movements with the other. Dr. Warner tells me that he considers these tests to be extremely delicate, and that even in a healthy person slight imperfections may be observed as the result of fatigue.

Finally, it may be remarked that anomalies of movement due to localized or general disease of the brain are not uncommon in aments. The chief of these are nystagmus, athetosis, epileptiform and epileptic convulsions, and chorea; but they do not differ from similar affections in the mentally sound.

Speech.—The subject of the speech of aments is one of considerable interest and importance, for several reasons. In the first

place, defects of speech are very frequent, and their examination affords a means by which certain sensory, associative, and motor functions may be conveniently tested and recorded. Further, quite apart from its mere mechanism, the language of these persons is one of the most valuable means we have of gauging their stock of ideas and the general capacity and nature of their intellects; whilst in the milder degrees the training of speech, if conducted upon scientific principles, and after a careful study of the needs of the individual, is a very important means of improving sensory and motor functions, and regulating mental action generally.

True speech is not merely the ability to utter articulate sounds: it is the faculty of using words to express thoughts; and before this can take place certain conditions must be fulfilled. These are, firstly, the power to hear sounds; secondly, a conscious recognition of the object or idea for which the sound heard is the symbol; thirdly, an ability to reproduce the sound as the expression of the same object or idea. It is thus seen that the faculty of speech is composed of an *afferent* pathway (normally auditory, although exceptionally other sensory channels may serve instead, as in lip reading), with its prolongation to a higher conscious station; of a connexion between this conscious station and the motor speech centre; and thence an *efferent* pathway to the muscles concerned in phonation and articulation. In addition, there is good reason for thinking that a more direct and subconscious connexion exists between the sensory and motor centres. The nervous mechanism concerned in speech may therefore be represented by the capital letter **A**, in which the side-limbs denote the afferent and efferent paths respectively to and from consciousness, and the cross-piece the shorter subconscious connexion between the sensory and motor stations.

In the normal child sounds are differentiated in the early months of life, but it is not until he is nearly a year old that he begins to associate words with objects and ideas, and to understand what is said to him. At this age he has still little command over the motor speech centre, the first evidence of activity in which consists of cooing and babbling interjections of spontaneous origin similar to the incessant small movements of fingers and toes. Presently, however, owing to the faculty of imitation, these irregular sounds become co-ordinated into copies of those he hears, and very soon after this the child acquires the power of expressing his simple

thoughts and wants by articulate speech. After this progress is usually rapid, and during the third year the child may possess a vocabulary of several hundred words.

In the ament defects of speech are exceedingly common, probably being present to some extent in fully three-quarters of all cases. In these persons the advent of speech is nearly always delayed, even the first indications of activity of the motor cells, which normally appear during the third or fourth month, not being noticed until much later, and the customary babbling is very often absent in the mentally defective child. It may be five, six, or even more years before the mentally deficient child gives utterance to a definite word as the expression of an idea. In the severest grades of mental defect the faculty is never developed, and the majority of idiots are incapable of articulating a single word. Others of this degree can say a few monosyllables, such as "man," "cat," but none of them are capable of forming sentences. In the imbecile speech is usually present, and he is able to understand and speak short sentences; but his vocabulary is small, and his utterance often almost unintelligible owing to faulty articulation. In the feeble-minded degree, imperfections of utterance tend to be somewhat less, and the vocabulary considerably more extensive; but these persons are usually neither capable of forming nor understanding a sentence at all complicated in its construction.

It is thus seen that on the whole there is a tolerably close relationship between the capacity for speech and the degree of mental defect, and this led Esquirol to suggest the use of this faculty as a means of classification. But to this there are many exceptions: some quite low-grade imbeciles are possessed of exceedingly good articulation and fluent speech, whilst a small number of the feeble-minded are limited in their utterance to a few words, and even these may be almost unintelligible. The remarkable genius of Earlswood Asylum, of whom a description will be given in a subsequent chapter, is an excellent example of this latter class. It is true that those imbeciles whose speech is so fluent often have little or even no idea of the meaning of the poetry or sentences they so glibly repeat, and it is quite open to question whether their articulatory capacity properly comes within the strict meaning of the term "speech." But even apart from this, I am of opinion that there is no such constant relationship between wealth of ideas and capacity of expressing them as would justify us in accepting speech as a means of differ-

entiation; and the physician must be upon his guard against judging of the degree of mental deficiency by the amount of speech.

In cases where there is no deafness, and speech is markedly deficient, it is highly probable that *some* degree of mental defect is present, and delayed speech is often one of the first signs to attract the parents' attention, and to cause professional advice to be sought; but as an indication of the *amount* of defect, the general behaviour under examination is often of far more importance than is speech.

Defects of speech may be due to anomalies of the sensory, motor, or intellectual (association) pathways; but in most cases it is the two latter which are chiefly at fault. **Sensory** defects may be auditory, causing an imperfect perception of sounds; or they may concern the tactile and muscular sensations coming from the tongue and lips during the act of articulation. It has already been remarked that the range and delicacy of the sensorium of the ament is often diminished, and in a few more or less actual deafness is present. I do not think, however, that imperfection of hearing proper plays a very important part in the defective speech of these persons.

Anomalies of the **motor** mechanism are much more frequent, and these comprise imperfections of the cortical speech centre, or of the end organs concerned in the production of voice and speech. With regard to central defects, pure motor aphasia is rare; but one boy, who was under my care for several years, was a perfect example of this condition. In this case there was at times considerable inattention; but the boy had no loss of hearing, and could understand and obey commands perfectly well. He could also make grunting and other inarticulate noises, but the only approach to a word which we could get him to say after years of training was "Cuckoo." This case, however, was one of secondary and not primary amentia, and resulted from an attack of encephalitis in the early months of life. Another and much more common cortical anomaly is the want of co-ordination which results in stuttering and stammering. Peripheral deficiencies are exceedingly numerous, and the whole character of the voice and speech may be profoundly altered by deformities of the tongue, lips, teeth, and palate, as well as by enlarged tonsils and adenoids. These, however, are relatively unimportant, as they only give rise to peculiarities of articulation. I doubt whether shortness of the frænum linguæ ("tongue-tied") can ever be considered a cause of delayed or even imperfect utter-

ance. *Aphonia*, in which the voice is so low that it can hardly be heard at all, may be due to either central or peripheral defects of the motor mechanism.

Defects of pronunciation are exceedingly common in even the mildest grades of amentia, and are attributable to imperfect co-ordination or to *lalling* and *lisping*. It is not usual to find any marked impairment of the vowel sounds, the chief imperfections being noticed in the consonants. The physiological alphabet of Wyllie* forms the basis upon which many interesting observations have been made in recent years, amongst which those of Dr. Henry Ashby† and Dr. Lapage‡ deserve particular mention. To this latter inquirer we are indebted for a most careful research into the consonantal defects of the feeble-minded child, and the following table is to a great extent compiled from his work. In this table the

TABLE VIII.

CONSONANTAL DEFECTS.

	Consonant.	*Commonly replaced by*	*As in*
Most frequently defective	1. Th	F or T	*F*umb, tee*f*, mou*f*. *T*ank.
	2. R	Y or L	*Y*abbit or *l*abbit, pa*ll*ot.
	3. Y	R or L	*L*ellow.
	4. S	T or Ts	*T*issors, *ts*oap.
	5. G	D	*D*un, do*d*, su*d*ar.
	6. Ng	D	Strin*d*.
	7. Sh	Tsh or T	*Ts*heep, *Ts*hu*d*ar, *T*irt.
	8. K	T	*T*at, *t*oat, bla*t*.
	9. V	B	*B*e*b*et.
	10. L	Y	*Y*eg *y*ad.
Less frequently defective	11. F	T	To*t*ee.
	12. Z	Dse	No*dse*.
	13. W	M (or omitted)	*M*indow.
	14. P	T or D	*D*a*d*er
	15. N	D	*T*ose, Pe*d*, Pe*dd*y.
	16. D	T	*T*oor, la*t*.
	17. T	D	*D*ee*f*.
	18. M	B	Ja*b*.
	19. B	P	*P*ag.

* Wyllie, "Disorders of Speech," 1904.

† Ashby, "Speech Defects in Mentally Deficient Children." *Medical Chronicle*, October, 1903.

‡ Lapage, *op. cit.*

consonants are placed in the order in which Dr Lapp[illegible] most frequently defective, the sounds commonly su[illegible] being shown (see Table VIII).

It is of interest to compare this defective p[illegible] of pr[illegible]on, which is so common in ar[illegible]nts, with the mar[illegible]aptit[illegible]es in this respect of some of the lowest sava[illegible] Darw[illegible]n his "Voyage of the *Beagle*," relates that the Fuegians c[illegible] repeat with perfect correctness each wor[illegible] in any sentence we addressed to them, and they remembered such words for some time. . . . All savages appear to possess, to an uncommon degree, this power of mimicry. I was told of the same judicious habit among the Caffres; the Australians, likewise, have long been noted for being able to imitate and describe the gait of any man, so that he may be recognized." As will be seen in speaking of idiot savants, such extraordinary powers are occasionally present in amentia but they are the exception and not the rule.

The disorders of speech which are chiefly due to commissural and intellectual defects include the misapplication of words and the inability to recall appropriate words; whilst it is only to be expected that where ideation is feeble the vocabulary will not be extensive. Various forms of *agrammatism* or imperfection in the grammatical arrangement of sentences, occur, sometimes with the production of sentences of a most extraordinary character. The enunciation of the grown-up amentia often retains much of the character of childhood, whilst a general brain inertia (sometimes, however, a timidity under examination) causes speech to be slurred, hesitating, indistinct and sometimes almost unintelligible. As Max Müller remarks, correct and distinct speech requires a definite mental effort, and of this many amentia are incapable.

[illegible]ments the condition known as *coprolalia*, or "filthy speech." This is a more or less sudden outburst of language of the most vile and disgusting character, and it is remarkable that it occurs in persons brought up amid every refinement. It is usually accompanied by a general state of mental excitement, for which however, no cause may be discoverable, and it has considerable analogy to the motor convulsions of the epileptic. It is also common in the insane.

Another interesting condition which is occasionally met with in the mentally defective, although by no means confined to them, is that of *idioglossia*. This is really a more extreme form of lalling,

but the consonantal substitution is so extensive that the child appears to be talking a totally different language peculiar to himself; hence the name.

Finally, mention must be made of that curious speech disturbance known as *echolalia*. In this condition, although the child can, and often does, use words to express his ideas, any question put to him is followed, not by a reply, but by its repetition. Sometimes, after repeating the question once or twice, the child will answer it; but in other cases he is merely repetitive, and often copies the tone and manner of the questioner with remarkable exactitude. I recently saw a mentally defective child with this peculiarity, whose parents assured me he could speak quite sensibly, and yet to my questions the only words I could get out of him were, "What is your name?" "Who is this?" (pointing to his mother), "Shut the door," and similar repetitions of every question or command. This condition is not very common, and is somewhat difficult to explain. I am disposed to think that it may be due to the child's consciousness being so swamped or occupied (by emotions of fright or anxiety in some cases at the presence of a stranger or unaccustomed surroundings) that auditory sounds only reach a subconscious motor idea centre, and are thence immediately translated into speech. There is, in fact, a short-circuiting of the nerve current. This condition, as far as I am aware, does not occur in persons of normal mental development, although it is, of course, by no means uncommon for a person to speak who is totally unconscious of his surroundings. Many normal children, whilst busily engaged in some occupation, will repeat words which are pronounced near them, without seemingly understanding the words or being at all aware of the fact that they have copied them. It is presumably by a similar subconscious mechanism that echolalia occurs.

It has already been mentioned that some aments have an extraordinary faculty for repeating sounds with extreme accuracy. This ranges from the humming of a tune to the repetition of poetry or sentences in an entirely unknown tongue. The subject will be again alluded to under Idiots Savants, but it is worthy of passing mention in this place.

Word Blindness and Word Deafness.—We may here refer to a form of disorder which, until the last few years, has attracted but little attention, but which nevertheless in all probability occurs

with considerable frequency. Dr. C. J. Thomas,* indeed, to whom we are indebted for the fullest account, considers that one child out of every 2,000 non-mentally defective school-children is word blind, whilst among mentally defective children the proportion rises to as much as one in twenty. The act of reading is dependent upon printed words being perceived as the symbols of particular ideas or objects. This process is a cortical one, and is subserved by an area of the temporal lobe. A defect of this area does not interfere with ordinary vision, but it may render the person incapable of recognizing the *meaning* of printed or written words, and he is then said to be word blind. Children so affected may be not only intelligent, but may evince considerable ability in drawing, manipulation, and even arithmetic; but it is impossible to teach them to read even words of one syllable, although they may sometimes know the meaning of a word if it is spelt out to them. The word deaf are similarly defective in the power of relating the sounds of words with their meaning, although there is no deafness in the ordinary way. Such children can write from a copy and can draw, and they may understand what a person is saying by watching the movement of his lips. Indeed, it is only by teaching them lip reading that there is any possibility of their learning to speak.

Another peculiarity which is occasionally found in aments, and which may be mentioned here, is that of *mirror-writing*, so called because, instead of being written from left to right in the ordinary way, the writing is reversed, and must be placed in front of a mirror to be read. The condition is not very common, and the explanation forthcoming not entirely satisfactory. I recently observed a variation of this peculiarity in an imbecile of ten years old. Upon giving him a sentence to copy, he did so from right to left in the usual manner of mirror-writers, but all the letters except one were formed in the proper way, so that the production ran thus:

rorriM yliaƆ ehT

We have now described the chief defects and anomalies of mental and nervous action which occur in persons suffering from amentia. It need hardly be said that they comprise a catalogue of the features of the class rather than a picture of any particular member of that

* C. J. Thomas, "The Aphasias of Childhood and Educational Hygiene," 1908.

class, and it is essential to bear in mind that, although all mentally defective persons resemble one another in the fact that the incomplete state of their minds renders them incapable of so adjusting their conduct as to maintain existence without external support, the extent to which they are thus incapable, the degree of their accomplishments, their particular psychological failings, and what we may term their general character, are subject to very wide variations. These are matters which will be dealt with when we consider the various clinical types in subsequent chapters.

CHAPTER VII

THE PHYSICAL CHARACTERISTICS OF AMENTIA

It has been shown that the great majority of cases of amentia belong to the primary or intrinsic group, being the result of a pathological variation of the germ plasm. In a few cases it may happen that this change only involves that portion of the germ cell concerned with the development of the central nervous system, which we may designate the " neuronic determinant "; the development of the remainder of the body may then pursue a normal course. In most cases, however, the germinal change is much more widespread. There would appear to be an impairment not merely of the neuronic, but of many other determinants, with the result that the whole or many portions of the body are marred by defects of anatomical development and physiological function. These defects are known as *stigmata of degeneracy*.

In recent years much has been said and written about degeneracy, and the most elaborate tables of its " stigmata " have been compiled. These have been divided into social, psychological, physiological, anatomical, and other groups, and some writers would seem to look upon any departure from their conception of what is or should be the normal social, psychological, physiological, anatomical, or other condition, as a " stigma " of degeneracy. I do not think this view is justifiable. In the first place, there are so many variations within healthy limits that the " normal " becomes exceedingly difficult to define. Moreover, it by no means follows that a condition which is uncommon, or even " abnormal," is on that account a mark of degeneracy, or that it is even pathological at all. We have not yet reached finality, and manners, morals, mind, physiological function, even anatomical structure, are, we trust, still in process of evolution; so that it is possible for some of these anomalies described as " stigmata " to be not retrogressive, but actually progressive.

But even where they are undoubtedly pathological or indicative of a diseased condition, it does not follow that on that account they are stigmata of degeneracy. As has already been shown, there are some diseases and toxic states of intra- or early extra-uterine life which are occasionally capable of producing secondary amentia, and in these cases, although the germ plasm is healthy, there may nevertheless be produced physiological and anatomical anomalies. There are also other diseases, such as rickets and syphilis, which may not produce mental deficiency, and yet which commonly result in bodily abnormalities. Even in cases of undoubted degeneracy, such as primary amentia, some of the body conditions which are commonly called " stigmata " seem to me to be not a concomitant effect of the germinal imperfection, but the result of the imperfect nervous action. This is probably the case with such physiological abnormalities as faulty body balance and carriage, defective co-ordination, and even peculiarities of physiognomical expression. Lastly, the examination of perfectly healthy children in public elementary schools, as well as of ordinary healthy members of the general population, will often reveal the presence of so-called " stigmata." In fact, if we are to class as degenerates all persons coming within the territory defined by some writers on this subject, there are few of us who will escape.

I am far from denying the existence of degeneracy and its stigmata. In fact, I consider primary amentia itself to be a true degeneration, and many of the anomalies of bodily condition present in these persons may rightly be described as " stigmata " of degeneracy. But I think we should be careful to restrict this term to such anomalies as are really manifestations of this state—that is, to peculiarities which are due to inherent defects of the germ plasm. In the present state of our knowledge this differentiation cannot always be made. Some—indeed, many—of the physical characteristics of amentia to be described are certainly the result of degeneracy, and it is not surprising that such should be numerous and severe in this condition, in the lower degrees of which degeneracy reaches its culminating manifestation. But some of these characteristics are not really degenerative, and therefore I think it better to describe them all simply as " anomalies " until such time as more detailed differentiation is possible.

It has been remarked that similar anomalies occur in persons who are not otherwise abnormal. Nevertheless, it is abundantly clear

that they are far more numerous in neuropaths and in aments than in the general population. Further, that their number and severity are, on the whole, directly proportionate to the degree of defect. Whilst, therefore, the presence of a single anomaly has little or no diagnostic importance, the presence of two, three, or more is of considerable significance as an indication of mental defect.

The table in the Appendix shows the various anomalies which have been noted in amentia; the chief of these may now briefly be described.

Anomalies of Anatomical Development.

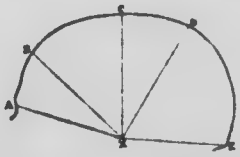
A. **Osseous System.**—Abnormal conditions of the skeleton occur with extreme frequency in amentia, and the number of these persons who do not present one or more well-marked bony anomalies is small. The cranium, palate, jaws, and teeth, are the parts most frequently affected.

Cranium.—Anomalies of the cranial vault may be revealed by inspection, palpation, and mensuration; also by tracings from pliable metal bands which have been moulded to the skull. Provided this latter method is carefully performed, it yields very accurate results, and Dr. Lapage* has recorded a most interesting series of observations taken in this way. The process, however, is somewhat too tedious for general work, and I think that for practical purposes mensuration is the most suitable. The following are the measurements I have been in the habit of taking for several years; they have the advantage of being easily carried out and recorded.

The measurements are taken from the upper point of attachment of the auricular pinna to the lateral aspect of the skull. This point was suggested to me many years ago by Dr. J. S. Bolton as being readily ascertainable in every case, and subject to little individual variation; it is designated "X." From the fixed point "X" of one side a tape-measure is passed in various directions to the corresponding point on the opposite side—namely, (A) over the glabella, (B) over the greatest frontal prominence, (C) vertically upwards, (D) over the greatest parietal prominence, (E) over the external occipital protuberance. An additional sagittal measurement is taken from the glabella over the cranial vault to the external occipital protuberance, and, if desired, a further measurement can be taken with the calipers between the two points "X."

* C. P. Lapage, "Feeble-mindedness in Children," *Medical Chronicle*, 1905.

These measurements are conveniently recorded by means of a diagram like the following, which can be rapidly drawn as occasion requires, or printed in one corner of the case-sheet:



It will be observed that the measurement XAX plus XEX gives the cranial circumference, XCX its vertical perimeter, and XBX and XDX the greatest frontal and parietal perimeters respectively. If the circumference be multiplied by XBX and XDX, a figure is obtained which is a convenient index of the total cerebral capacity.

The general conclusion at which I have arrived, as the result of an extensive series of measurements of the crania of normal, insane, epileptic, and defective persons, is that in the majority of aments there are marked departures from the normal; but that there is no particular type of skull which is characteristic of that condition. The chief anomalies are the following: *Circumference:* The average normal circumference of the male adult is 22 inches, and of the female 21¾ inches. The circumference at other ages will be seen by reference to the Table of Developmental Data. Occasionally the skull of the ament exceeds the normal, particularly where hydrocephalus or sclerosis is present; and cases presenting cranial enlargement are sometimes grouped together as a clinical variety under the term "macrocephalics." But macrocephaly may arise from so many different causes that I think this is to be deprecated. More often the cranial circumference is decidedly less than the normal, and in one clinical variety of amentia (microcephaly) it is often as little as 15 inches. There is often a diminution of the frontal and parietal perimeters, whilst a subnormal development of the occipital portion of the skull is exceedingly common. *Symmetry:* The two halves of the normal skull not infrequently differ slightly in size, but this condition is much commoner and far more marked in aments. Where paralysis has existed from an early age, this condition is very frequent, the lessened measurement corresponding to the area of brain destroyed or arrested in its development, but asymmetry of the cranium is often observed in the absence of any paralytic signs. Usually the left half is the smaller.

Lapage found that lateral asymmetry occurred in 158 cases out of a total of 198, the left half being the smaller in 122, and the right in 36. *Cranial bosses* are frequently present, probably as a result of rickets, the most common situations being the ossific centres of the frontal and parietal bones. In a few cases an interfrontal ridge is seen. Finally, the whole conformation of the skull may be so unusual as to merit a special designation.

The following are the three chief varieties: *Oxycephaly*, in which there is such a marked deficiency in the frontal and occipital regions that the skull shelves away upwards like a cone or " sugar-loaf." This is a characteristic of the microcephalic variety of aments. *Scaphocephaly*, in which the cranium is long and flattened from side to side, and converges upwards to a central " keel " situated in the sagittal line, thus resembling an overturned boat. *Spherical*, in which the whole skull is small, globular, and devoid of the usual cranial prominences; this is characteristic of Mongolism. These various anomalies of shape and symmetry, as well as the total capacity, can be roughly but readily gauged if the palm and outstretched fingers of the observer's hand are placed over the vertex of the skull.

Palate.—The association of abnormalities of the palate with mental deficiency has long been recognized, and there is no doubt that it is one of the commonest malformations occurring in this condition. Many years ago Langdon Down* drew attention to the subject, and more recently Clouston† has recorded a large number of observations which show conclusively that, although deformed palates occur in the normal, they are far and away more frequent in neuropaths and the mentally defective. He states that deformed palates are present in 19 per cent. of the ordinary population, 33 per cent. of the insane, 55 per cent. of criminals, but in no less than 61 per cent. of idiots. Petersen,‡ who has made a most exhaustive study of this question, and has compiled an elaborate classification of the various anomalies, found palatal deformities present in no less than 82 per cent. of aments, in 76 per cent. of epileptics, and in 80 per cent. of the insane.

Without going into ultra-refinements, it may be stated that the

* J. Langdon Down, Transactions of the Odontological Society of Great Britain, 1871.

† T. S. Clouston, " Neuroses of Development," 1891.

‡ Petersen and Church, " Nervous and Mental Diseases," 1904.

majority of the anomalies met with may be arranged under two headings as follows:

1. *Saddle- or Keel-Shaped Palates.*—In this, the commonest type, there is a contraction of the alveolar arch between the bicuspid and molar teeth, the palate at the same time extending upwards to a considerable distance, at the expense of the nasal cavity. In consequence an appearance like the inside of a saddle or boat's keel is produced. It is sometimes marked by a narrow central antero-posterior furrow, but the front teeth do not usually protrude in this type of palate.

2. *V-Shaped Palates.*—These are not so frequent as the former, and are produced by a gradual narrowing of the dental arch from the first molars to the central incisors, the point of the V being thus directed forwards. Palates of this type may also be higher than normal, and the narrowing of the fore-part of the arch usually causes considerable overcrowding and protrusion of the front teeth.

A great deal of discussion has raged round the cause and manner of production of these anomalies.* It has been contended by E. S. Talbot that they only appear during the second dentition, between the sixth and twelfth years; but this is denied by Clouston, John Thomson, and other physicians of great experience, and I have certainly seen numerous instances before this period. I think there can be little doubt that most of them are real stigmata, and a further indication of those formative defects which play such a prominent part in the production of amentia. At the same time it is to be remembered that the palate, like the external ear, is probably undergoing considerable evolutionary changes, and many of the slighter anomalies may be due to this cause, or merely be an expression of defective nutrition during the developmental period.

Cleft palate appears to be on quite a different footing, and it is doubtful if this condition and its common associate, hare-lip, can be regarded as real stigmata of degeneracy. It is but rarely met with in amentia, Langdon Down finding it only in 0·5 per cent., and Ireland in 1 per cent., of idiots; whilst Talbot† examined 1,977 feeble-minded children without meeting a single instance. These proportions do not differ materially from the normal, for Grenzer (quoted by Talbot) found 9 cases on examining 14,466 presumably normal children. I have seen many instances of cleft

* See the chapter on "Genetous Idiocy" in Ireland's book.

† E. S. Talbot, "Degeneracy," 1898.

palate and hare-lip in children who presented no other mental or physical imperfection whatever.

Jaws.—Many aments have a receding, others a protruding, mandible, the former being very common in microcephalics. Asymmetry of the upper or lower jaw is not uncommon.

Teeth.—Considering the frequent occurrence of deformities of the palate, it is not surprising to find that anomalies of the teeth are very common, and a good set of teeth is exceedingly rare in the mentally defective. They are usually late to appear, malformed and unhealthy when present, and prone to early decay and disappearance. Where a V-shaped palate is present, the upper incisors and canines are generally huddled together and protruding, at times to such an extent as to be left uncovered by the lip. The remaining teeth may be very irregular in arrangement, and there are often large gaps between them. The wisdom teeth are seldom seen. It often happens that the teeth erupt at different planes of the alveolus, and I have occasionally seen a complete double row of incisors. In addition, the teeth are individually ill-formed, often honeycombed or marked by transverse striæ, very unhealthy, and surrounded by a foul mass of exudation.

Other defects of the osseous system are seen in the presence of talipes, polydactylism, syndactylism, and various deformities of fingers and toes. It is by no means uncommon to find two fingers on each hand welded together, and occasionally the hand consists of thumb and an ill-shaped mass composed of the blending of the four fingers—the so-called "lobster" hand. In one mentally deficient child presenting this last anomaly I found, on inquiry, that it has existed in the antecedents and collaterals for three, and possibly four, generations. The arms are often disproportionately long.

With regard to *stature*, a condition of gigantism may be present. This, however, is exceptional, and as a rule the stature is diminished, the average height of aments being several inches less than that of the ordinary population. This was shown in the Final Report of the Anthropometric Committee of the British Association, issued in 1882, from which it appears that of all the various classes of the community investigated, aments are both the smallest and lightest in weight. Dr. H. H. Goddard,* in a very interesting paper on this question, finds that not only do aments as a class

* H. H. Goddard, *Journal of Nervous and Mental Disease*, April, 1912.

compare very unfavourably in these respects with the normal population, but that the greater the degree of defect, the more marked is the discrepancy. In the case of the feeble-minded, he finds that whilst growth takes place in a practically normal manner during the earlier years of life, it tends to be arrested at a lower age. I have noticed this fact myself, but only in the case of the very mildest grade of defect, and of aments in general it may be said that growth is usually defective from the earliest years of life.

B. **Special Sense Organs**—*Ear*.—It is probable that, owing to alterations which have taken, and are taking place in the sense of hearing, the external ear is at present in a state of considerable evolutionary instability. It is, therefore, not surprising to find that anomalies of this structure occur in normal persons, amongst whom, as a matter of fact, they are extremely common. This being the case, it is evident that, as an indication of degeneracy, such anomalies are in themselves of little value, and I must dissent from the dogmatic utterances of some writers that a certain type of ear can be labelled "criminal," another "insane," and so on. At the same time, there is no doubt that, frequent as are such departures from the normal in the ordinary population, they are still very much more frequent in degenerates; and when they occur in combination with two other classes of defects—namely, of the cranium and palate—I believe that they have considerable diagnostic value.

With regard to the frequency of auricular defects, the figures ascertained by Gradenigo,* although they do not relate specifically to amentia, are of considerable interest. As the result of his examination of several thousands of persons of both sexes, this observer found that the external ears were regular and normal—in 56 per cent. of males and 66 per cent. of females of the *ordinary* population; in 36 per cent. of males and 46 per cent. of females of the *insane* population and in 28 per cent. of males and 54 per cent. of females of the *criminal* population. Also that in the insane and criminal classes, not only were ear anomalies more frequent, but they were of greater gravity. As tending to show that some ear anomalies may be progressive rather than retrogressive, it may be stated that Talbot found certain varieties were more frequent in ordinary persons than in degenerates.

The varieties of malformation of this structure which are met

* Gradenigo (*Arch. de Psychiatria*, 1890 and 1892), quoted by Talbot in "Degeneracy."

with in persons suffering from amentia are so numerous that a detailed account of them all is impossible. There is no portion of the external ear which may not be affected, but the following are the chief conditions met with: Defects of the lobule are decidedly the most frequent; it is often unusually large and fleshy; it may, however, be smaller than usual, and at times even absent; it is occasionally adherent to the face. Another very common deformity is that in which the whole ear is excessively large, prominent, and outstanding, with a marked convexity as seen from behind. Another common type is the reverse of this, the entire pinna being small, thin, and circular, strongly recalling the ear of the chimpanzee. With or without any of these gross changes there may be numerous minor malformations of the helix and antihelix, the tragus and antitragus. Supernumerary auricles are occasionally present, but I do not think that anomalies of the Darwinian tubercle are more frequent in aments than in the normal population. It is very common to find the ears markedly different on the two sides. It occasionally happens that the auditory apparatus is so imperfectly developed that total or severe deafness results. This, however, is uncommon, and deafness, when present, is usually the result of disease, especially suppuration of the middle ear.

Eye.—Anomalies of the eye and its appendages are exceedingly common in aments, those most frequently seen being the following. Epicanthus, a ridge of skin continued from the upper eyelid around the inner canthus; it is apparently due to an unusual redundancy of skin in this region, and disappears whilst the skin over the bridge of the nose is pinched up between the fingers; it may be unilateral, but usually affects both eyes, and is a tolerably frequent anomaly in aments, although not unknown in normal children. Palpebral fissures which are small and obliquely placed, so that the inner is lower than the outer end, are a characteristic feature of, and give the name to, the Mongolian variety of amentia. Differently coloured and speckled irides are very common, as also are strabismus, astigmatism, hypermetropia, and less frequently myopia and nystagmus. Corneal opacities are frequent, and a small proportion of the lower grades are congenitally blind; but colour-blindness does not appear to be more prevalent than in the ordinary population.

Nose.—A clear-cut, well-formed nose is not often seen in aments, and this organ is usually either considerably flattened or depressed, or is large and prominent, with wide fleshy nostrils which

look forwards rather than downwards. Deviation of the septum and nasal bones may also occur.

The *Lips* are often thick, coarse, prominent, and unequal in size. The mouth is heavy and flabby-looking, generally open, and devoid of either refinement or firmness. Hare-lip is not common.

The *Tongue* is often abnormally large, fissured, and its papillæ hypertrophied, particularly in the Mongolian variety.

C. **Muscular and Cutaneous Systems.**—Various anomalies of the skeletal muscles have been found upon dissection, but they are hardly of sufficient importance to merit further description. Abnormalities of the skin are frequent, and consist of coarseness of the integument, excessive and unpleasant secretion, webbing of the fingers, moles, and nævi. There is often an excessive development of hair upon parts usually hairless, and a lack or deficiency upon those which are generally covered, particularly the face and chin in males. The finger- and toe-nails are often very imperfectly formed.

Adenoma Sebaceum.—In this place reference may be made to this peculiar condition of the skin sometimes seen in aments, and with extreme rarity in normal individuals. Indeed, with the exception of two patients, all the cases seen by Crocker have been in imbeciles or chronic epileptics. Adenoma sebaceum is a papular new growth which is confined to the face, and is chiefly seen on the side of the nose, but occasionally on the forehead or chin. It is usually, but not always, symmetrical, and the lesions are often numerous. They are either firmly embedded in, or project from, the skin, and they vary in size from a pin-head to a small pea. They are of a whitish or yellowish colour, but sometimes bright red owing to numerous telangiectases. The papules are made up of an overgrowth of sebaceous glands and capillary vessels, often surmounted by a thickened corium. In many cases they are present at birth, but in others they do not appear until late in childhood or puberty. As a rule they persist throughout life, but occasionally undergo spontaneous involution with scarring.*

D. **Circulatory and Respiratory Systems.**—The most important anomalies are stenosis of the pulmonary artery and defects of the auricular and ventricular septa. The heart is usually smaller than that of a normal person of corresponding weight.

* See Pringle, *British Journal of Dermatology*, 1890, vol. ii., and Crocker, "Diseases of the Skin," 1893.

E. **Alimentary Systems.** — Numerous anomalies of the various organs of this system have been observed upon dissection. Meckel's diverticulum is not very rare, and Talbot states that the appendix is best developed in degenerates.

F. **Urinary and Generative Systems.** — Lobulation of the kidneys is not uncommon, and anomalies of the genital organs are of considerable frequency. These consist, in the male, of epi- and hypospadias, infantile condition of the penis, and cryptorchism; in the female an infantile condition of the uterus is generally present, and the ovaries are often fibrous. Cloacal openings have been observed in both sexes. Supernumerary mammæ are common.

G. **Nervous System.**—These anomalies have already been described in the chapter dealing with Pathology.

Anomalies of Physiological Function.

It is naturally to be expected that organs which are the site of grave defects of structure or anomalies of anatomical development should also be imperfect in their working, and hence physiological anomalies are exceedingly frequent in the mentally defective. Thus, the condition of the heart leads to an enfeebled circulation, so that cyanosis and coldness of the extremities, chilblains, and sores are exceedingly common. Defects of the organs of special sense are a factor in producing a diminished perceptivity. Non-development of cortical areas or of the internal structures of the encephalon cause various degrees of paralysis, with their accompanying deformities. Indeed, the mental deficiency itself may be considered as an imperfection of physiological function due to neuronic changes, whilst the various neuroses and psychoses, such as insanity, epilepsy, hysteria, and one-sided genius, as well as the moral perversions, seen in prostitution, inebriety, and other anti-social and criminal tendencies, are of the same order.

With regard to the functions of the generative organs, there is no doubt that many of these persons can propagate their kind, and there are, unfortunately, numerous examples where this has taken place. The milder aments, indeed, appear to be unusually prolific. At the same time, in the male sex, the advent of puberty is often considerably delayed, and may not appear until late in the teens. In the male this subject has been very fully investigated by Bourne-

ville and Sollier,* who drew attention to a considerable retardation of puberty, as well as to the presence of frequent genital anomalies like those referred to. In the female, on the other hand, a similar retardation does not appear to be the case, and it is stated by Jules Voisin,† who has studied the subject closely, that the development of puberty takes place at a normal age, and that menstruation recurs at regular periods. Doubtless of many, or even most, female aments this is true, and amenorrhœa and dysmenorrhœa do not appear to be commoner in them than in those of normal intelligence; indeed, the latter seems to be less so. It is, however, to be remembered that in some of the pronounced idiots menstruation never appears at all.

René and Henri Larger have drawn attention to the obstetrical stigmata of degeneracy; indeed, they have formulated a law that, "given any anomaly of gestation, one can always and necessarily conclude the presence of hereditary antecedents, either neuropathic, or psychical, or teratological, of either of the generators, or both." Their conclusions have been stoutly contested by Porak, and defended with equal vigour by Roy. Whilst not being prepared to go so far as MM. Larger, I think it is certainly a fact that anomalies of gestation and parturition are much commoner in the degenerate than in the normal population.

It may be remarked that the majority of mentally defective children are late in acquiring control over the bladder and rectum; indeed, in the lowest grades such control may never be developed.

A similar retardation of physiological action is seen with regard to dentition, speech, and walking. Inquiries show that a large proportion of aments do not cut their first or second teeth until some considerable time after the ordinary period. Many of them do not attempt to stand until their third year, and walking is correspondingly late. In many cases the child is four or five years old before it says a word.

But in addition to these functional defects of particular organs, many aments are characterized by a physiological inadequacy which is general and widespread. Their temperature-regulating mechanism is so imperfect that colds and chills are exceeding common. Their metabolism is so defective that, in spite of abundance of wholesome food, most of them remain small, stunted, and ill-

* Bourneville and Sollier, "Anomalies des Organes Génitaux chez les Idiots et les Imbéciles," *Progrès Médical*, 1888.

† Jules Voisin, "L'Idiotie," 1893.

nourished. It is probably the same defect which causes so many female aments to become excessively fat and ungainly after the climacteric. They have an increased predisposition to illness, and readily contract disease, and their physiological margin and power of resistance are so diminished that disease quickly proves fatal. In fact, the history of a very large proportion of these patients may be expressed in two words—*defective vitality*—and the supervision of the physician is often as necessary for their bodily as for their mental ailments. The late Dr. Langdon Down remarked the fact that "many cases of imbecility, particularly those of the Mongolian variety, lose a large amount of intellectual energy in the winter—go through, in fact, a process of hybernation, their mental power being always directly as the external temperature."

Mortality.

The physical welfare of the ament of to-day is the subject of far more care and attention than was the case a few generations back. Then many perished who, under present conditions, would have survived; and there can be no doubt that modern medical and surgical practice, together with advances in preventive medicine, have diminished the mortality rate, not only of the fit, but of the unfit also.

Nevertheless, the vitality of aments as a class is decidedly inferior to, and their expectation of life still remains appreciably less than, that of the ordinary population. Even amid the well-ordered surroundings of an institution the number of these persons of at all advanced age is relatively small, and in the world outside the proportion is still less. I am disposed to think that the mortality has, generally speaking, a direct relation to the degree of deficiency.

This diminished expectation of life was well shown by some figures collected by Dr. Shuttleworth with regard to patients in the Royal Albert and Earlswood Asylums. Dr. Shuttleworth found that at all the quinquennial periods from the fifth to the twentieth year of life the mortality rate of aments was between nine and ten times as great as it was amongst the general population. This higher mortality rate at the earlier ages of life is shown by some recent figures supplied by the Lunacy Commissioners, in which the mortality rate, at different age periods, of the inmates of idiot institutions (which include all grades of amentia) is contrasted with similar rates for the whole population.

TABLE IX.*

SHOWING (1) THE RATIO (PER 1,000) OF THE NUMBER OF DEATHS (DURING THE YEAR 1907) TO THE NUMBER OF PERSONS LIVING IN IDIOT ESTABLISHMENTS (INCLUDING IDIOTS, IMBECILES, AND FEEBLE-MINDED), COMPARED WITH (2) THE RATIO (PER 1,000) OF THE NUMBER OF DEATHS AMONG THE WHOLE POPULATION (DURING THE YEAR 1907) TO THE WHOLE POPULATION: ARRANGED ACCORDING TO AGE.

Age Groups ..	*Under* 15.		15-19.		20-24.		25-34.		35-44.		45-54.		55-64.		65 *and Upwards.*		*All Ages.*	
Sex	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*	*M.*	*F.*
Ratio per 1,000 of *Aments* † ..	8·8	32·4	15·5	51·3	42·2	‡	24·5	24·4	9·3	20·8	33·3	‡	‡	‡	‡	‡	22·9	32·2
Ratio per 1,000 of *Whole Population*	17·5	14·8	2·9	2·7	3·3	3·2	5·6	4·6	9·5	7·8	16·9	13·1	33·7	26·0	94·1	85·9	16·0	14·1

* From Appendix A, Table XIII., Sixty-Third Report of Lunacy Commissioners, 1909.

† Based upon a total of 1,308 male and 684 female aments living, and a total of 30 male and 22 female aments dying.

‡ The ratio in these divisions is not given, as, owing to the small number of patients in them, they are likely to mislead.

The same liability to early death is also shown by the following table, which gives the ages at death of 1,000 consecutive deaths in Earlswood Training Institution. For these particulars I am greatly indebted to Dr. C. Caldecott, Medical Superintendent, and Dr. F. H. Pearce, Assistant Medical Officer.

TABLE X.

SHOWING AGE PERIODS OF 1,000 CONSECUTIVE DEATHS IN EARLSWOOD ASYLUM, DATING BACK FROM OCTOBER, 1907.*

	Males.	*Females.*
Under 5 years	2	1
5 to 9 ,, ...	70	40
10 ,, 14 ,, ...	162	71
15 ,, 19 ,, ...	180	101
20 ,, 24 ,, ...	88	42
25 ,, 34 ,, ...	66	38
35 ,, 44 ,, ...	37	28
45 ,, 54 ,, ...	22	12
55 ,, 64 ,, ...	20	9
65 ,, 74 ,, ...	6	4
75 ,, 84 ,, ...	—	1
Total	653	347
	1,000	

Owing to the impracticability of ascertaining the total number of persons alive at corresponding ages, these figures cannot, of course, be compared with the mortality tables relating to the general population. They are, nevertheless, of considerable interest as further corroboration of the fact shown in Table IX.—namely, that the highest death-rate falls between the fifteenth and twentieth years, the period of life in which the mortality rate is lowest among the general population.

The following table, also kindly supplied by Dr. Caldecott, is of interest as showing the percentage of deaths to the number of patients in residence at Earlswood Asylum over a period of twenty-one years. It is impossible by means of these figures to institute an accurate comparison between the mortality of aments and of the

* Patients under the age of six are not eligible for the institution, excepting those that come in on payment scales.

general population, for the reason already mentioned; nevertheless, they afford clear evidence of the excessive mortality rate in aments. The crude annual death-rate in England and Wales per 1,000 persons living, of all ages and both sexes, is well under 20, whereas we see that even in a well-equipped and excellently managed institution like Earlswood the average mortality is over

TABLE XI.

SHOWING THE PERCENTAGE OF DEATHS TO THE NUMBER OF PATIENTS IN RESIDENCE AT EARLSWOOD ASYLUM OVER A PERIOD OF TWENTY-ONE YEARS, FROM DECEMBER 31, 1890, TO DECEMBER 31, 1910.

Year.		*Percentage of Deaths to Average Number Resident.*		
		Males.	Females.	Total.
Ending December 31	1890	1·91	3·66	2·46
	1891	1·58	4·68	2·56
	1892	3·05	3·22	3·10
	1893	4·55	4·18	4·42
	1894	3·63	6·88	4·37
	1895	2·04	3·24	2·40
	1896	3·09	4·25	3·40
	1897	2·88	3·66	3·14
	1898	3·50	3·72	3·61
	1899	2·73	3·80	3·11
	1900	3·17	2·18	2·83
	1901	2·40	3·93	2·93
	1902	1·78	3·91	2·52
	1903	2·65	6·89	4·09
	1904	6·00	5·80	5·99
	1905	3·50	4·20	3·70
	1906	2·25	7·04	3·75
	1907	3·19	5·94	4·02
	1908	4·23	2·19	3·60
	1909	3·24	3·70	3·38
	1910	2·71	5·18	3·43

30 per 1,000, and this relates to a selected age class, there being a disproportionately small number of persons over middle age and practically none under six years, so that the two most vulnerable life periods are excluded.

Causes of Death.

The causes of death in 1,000 consecutive deaths are shown in Table XIII. (pp. 154, 155). The figures there given must not, of course, be confounded with the ordinary mortality rates from the various diseases; nevertheless they are of considerable value as showing the relative incidence of the various fatal diseases in aments.

It is seen from this table that by far the commonest cause of death is tuberculosis, which accounts for 39·6 per cent., or nearly two-fifths, of those dying. The fatal varieties of this disease are as follows:

TABLE XII.

	Males.	*Females.*	*Total.*
Pulmonary tuberculosis	199	106	305
General ,, ...	37	17	54
Meningeal ,, ...	10	1	11
Abdominal ,, ...	9	8	17
Osseous ,, ...	6	3	9
	261	135	396

The next most common cause of death is epileptic convulsions, which claims 17·7 per cent. of the total; whilst pneumonia is a very good third, being responsible for 10·4 per cent. of total deaths. It is interesting to note that, excluding tubercle, the nervous system is the part most frequently involved by fatal disease, being followed in order by the respiratory, circulatory, alimentary, and urinary systems. Not that diseases of the nervous system are the cause of the mental deficiency, but because the imperfection of development and imperfect function of the nervous system render it peculiarly prone to disease.

TABLE XIII.

SHOWING THE CAUSE OF DEATH IN 1,000 CONSECUTIVE DEATHS IN EARLSWOOD ASYLUM.

Cause of Death.	*Males.*	*Females.*	*Totals.*	
			Number.	Percentage to Total Deaths.
I. Zymotic Diseases:				
Measles	10	14		
Scarlet fever	11	8		
Diphtheria	10	6		
Enteric	6	3		
Erysipelas	5	1	83	8·3
Pertussis	3	1		
Influenza	1	0		
Septicæmia	2	1		
Pyæmia	1	0		
II. Constitutional Diseases:				
Tuberculosis	261	135		
Rheumatic fever	2	0		
Purpura	1	0		
Scorbutus	0	1	413	41·3
Cancer and sarcoma	6	6		
Goitre	0	1		
III. Developmental Diseases:				
Marasmus and debility	9	4		
Premature senility	11	3	30	3·0
Senile decay	1	2		

IV. Accidental:					
Burns and scalds	2	2	8	0·8	
Phosphorus-poisoning	1	0			
Fractured jaw	1	0			
Drowned	1	0			
Accumulation of hair in stomach	1	0			
V. Local Diseases:					
(a) *Nervous System:*					
Meningitis, encephalitis, and other diseases of brain	32	21	236	23·6	
Convulsions, status epilepticus, and exhaustion due to epilepsy	115	62			
Systemic diseases of spinal cord	3	0			
(b) *Circulatory System:*					
Morbus cordis, pericarditis, syncope	26	16	49	4·9	
Dropsy, gangrene, embolism	5	2			
(c) *Respiratory System:*					
Pneumonia	76	28	126	12·6	
Bronchitis	6	8			
Pleurisy	5	2			
Empyema	0	1			
(d) *Digestive System:*					
Stomach (hæmatemesis, gastritis)	2	0	43	4·3	
Intestine (enteritis, colitis, peritonitis, perforation, volvulus)	27	9			
Liver (hepatitis, impacted gall-stone)	3	1			
Spleen (rupture)	1	0			
(e) *Urinary System:*					
Nephritis	7	4	11	1·1	
(f) *Osseous* (necrosis, mastoid abscess)	1	1	2	0·2	

CHAPTER VIII

FEEBLE-MINDEDNESS IN CHILDREN (MENTALLY DEFECTIVE CHILDREN)

THE term *feeble-mindedness* is applied to the mildest of the three degrees of amentia. In the grade of their deficiency there is no difference between the feeble-minded child and adult; but as the former are subject to the provisions of a special Act of Parliament, which brings them within the jurisdiction of the education authority, it is necessary to consider them separately. In this chapter, therefore, we shall consider feeble-minded persons below the age of sixteen years, or, as they are designated in the Act, *mentally defective children;* those over this age will be described as "feeble-minded adults" subsequently.

After the passing of the Education Act of 1876, making attendance at public elementary or other schools compulsory, it gradually became apparent that a group of children existed who were so far mentally defective that they could not be satisfactorily taught in the ordinary public schools, but who were not sufficiently defective to be certified as imbeciles or idiots under the Idiots Act of 1886. Many particulars regarding this class were brought to light through the inquiries of medical men and scientific and philanthropic societies, amongst whom special mention must be made of Dr. Francis Warner, Dr. Fletcher Beach, Dr. Hack Tuke, and Dr. Shuttleworth; the British Association, the British Medical Association, and the Charity Organization Society. The researches of Dr. Francis Warner in particular were of the most painstaking nature, and were based upon the examination of 100,000 school-children.* As a result of these inquiries, a Departmental Com-

* See "Report on the Scientific Study of the Mental and Physical Conditions of Childhood," Parkes Museum, 1895; also "Report on the Feeble-minded," etc., C.O.S., 1892.

mittee of the Board of Education was appointed in 1896 to consider and report upon the question.

This Committee presented its report in 1898.* It recognized that a number of children existed in public elementary schools who, in their mental capacity, were intermediate between the ordinary "dullards" and certifiable imbeciles, and it estimated the proportion of this class as approximately 1 per cent. of the elementary school population. Its inquiries showed that these children were incapable of receiving proper benefit from the ordinary instruction in these schools, but that they were capable of receiving considerable benefit from the individual attention and instruction given in special classes—that, in fact, under such conditions there was a fair prospect of many of them being enabled to take their place in the world. It considered that these defective children would suffer by association with imbeciles, and should not, therefore, be educated with them; and it recommended that special classes and schools should be established to meet their requirements. This report led to the passing in the following year of the Defective and Epileptic Children (Education) Act.

This Act (62 and 63 Vict., ch. 32, 1899) was the first legal recognition in this country of the mildest or feeble-minded grade of amentia. It defines the class as those children who, "*not being imbecile, and not being merely dull and backward, are defective—that is to say, by reason of mental (or physical) defect are incapable of receiving proper benefit from the instruction in the ordinary public elementary schools, but are not incapable by reason of such defect of receiving benefit from instruction in such special classes and schools as are in this Act mentioned.*"

This Act, therefore, clearly differentiates between the mildest degree of mental defect and the more pronounced affection of imbecility, and although it does not apply the term "feeble-minded" to this class, the condition it defines is practically identical with that to which this term has for long been specifically applied in this country. It is probable that in some of these children the mental defect, although permanent, is not sufficiently severe to justify their inclusion within the category of amentia as defined in this book. But such cases are exceptional, and in my experience the great bulk of the children who come within the definition just

* "Report of the Departmental Committee on Defective and Epileptic Children." 1898.

quoted are, in later life, incapable of maintaining existence without supervision, and are therefore true aments; they are, in fact, the juvenile feeble-minded. This is recognized by the Mental Deficiency Act of 1913, which defines feeble-minded children as those who, "by reason of mental defectiveness (from birth or from an early age, not amounting to imbecility), appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools." The Education Act permits the local education authorities to establish special classes and schools for the mental defectives within their district, and where such are established attendance is compulsory up to the age of sixteen years, instead of fourteen, as in the ordinary schools. Unfortunately, owing to its permissive and not obligatory nature, the Act still remains a dead letter in many parts of the country; but since it has been adopted by the whole of London, as well as by over twenty of the largest towns of England, the education of mentally defective children may now be said to have become an integral and important part of the educational system of the nation, and there is every reason to think that this Act will shortly be made compulsory.

The investigations instituted by the Royal Commission of 1904 yielded much further light upon the number and condition of this class; but whilst agreeing in several respects with the conclusions previously arrived at, they differed on two important points. Firstly, as will be seen immediately, the 1 per cent. estimate was found to be somewhat too high; secondly, a more extended experience of these children showed that the views which were formerly held as to the amount of amelioration under training, and their possibility of becoming self-supporting citizens, were too optimistic.

Numerical Incidence.

Owing partly to the difficulty attending diagnosis, and partly to the great variations of incidence in different localities, the precise enumeration of mentally defective children is practically impossible, and all that can be given is an approximate estimate. From the statistics furnished by the investigators appointed by the Royal Commission it may be calculated that, on the average, 0·73 per cent. of the children attending the public elementary schools of England and Wales belong to this class. There are, however, another 0·10 per cent. who, for various reasons, are not attending elementary

schools, and if these be added, the proportion of mental defectives is raised to 0·83 per cent. of the school population, corresponding to a total of 50,665 mentally defective children of school age in England and Wales in the year 1905. The returns which have since been furnished to the Board of Education by school medical officers throughout the country would indicate that the proportion of defective children in the school population is somewhat less than this—namely, about 0·5 per cent.; but as routine official inquiries can rarely be as exhaustive as special investigations, I am disposed to think that the figures of the Royal Commission more nearly represent the true incidence.

But, as will be seen from the accompanying Table XIV., showing the percentages in the respective districts investigated, this figure is the mean average of two widely divergent extremes. In Durham, for instance, the percentage is only 0·24, whilst in Dublin it is as high as 1·85, and it becomes necessary to consider the cause of these extreme variations.

TABLE XIV.

SHOWING THE PERCENTAGE OF MENTALLY DEFECTIVE CHILDREN TO THE PUBLIC ELEMENTARY SCHOOL POPULATION IN CERTAIN DISTRICTS INVESTIGATED BY THE ROYAL COMMISSION OF 1904.

	District.	*Percentage.*
Urban	Manchester	1·20
	Birmingham	1·03
	Hull	0·30
	Glasgow	0·74
	Dublin	1·85
	Belfast	0·50
Industrial	Stoke-on-Trent	0·59
	Durham	0·24
	Cork	0·35
Mixed industrial and agricultural	Nottinghamshire	0·66
	Carmarthenshire	0·76
Agricultural	Somersetshire	0·61
	Wiltshire	0·55
	Lincolnshire	0·96
	Carnarvonshire	0·47
	Galway	1·33

Much of the difference is clearly related to the fact that the incidence of mental abnormality in general (insanity and amentia) is not uniform throughout the country, but is subject to very considerable variations from causes which at present are not fuily

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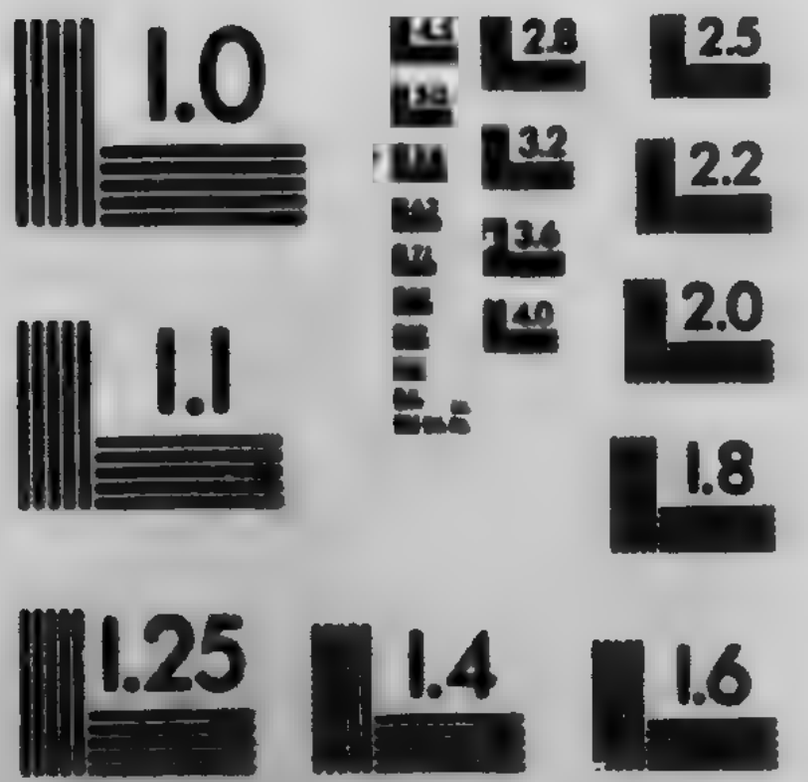

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understood. This we shall not consider. But there are smaller variations which appear to be dependent upon sociological and other influences, and since these relate, not to mental abnormality in general, but to the particular class with which we are now dealing, they must be referred to.

Relative Incidence in Town and Country.—It has been shown that although amentia as a whole is more prevalent in rural, and insanity in urban, districts, and the number of idiots and imbeciles in the country far exceeds that in the towns, nevertheless the incidence of mentally defective children is decidedly greater in the towns than in the country. In view of the fact that these children differ only in degree, and not in kind, from the idiots and imbeciles, this is in itself singular; but it becomes even more so when it is found that the feeble-minded adult, who is simply the mentally defective child grown up, is not more prevalent in town than in country, but is actually less so. What, then, is the cause of this excess of mentally defective children in a town as compared with a country environment?

The answer which at once suggests itself is that the many adverse factors of the environment of our towns, the improper feeding, the faulty ventilation, the overcrowding, and, in fact, slum life generally, are responsible for the excess; and since a history of morbid heredity is often very difficult to obtain in these cases, the (perhaps not unnatural) conclusion has followed that environment plays a very important part in the production of this mild degree of amentia. That feeble-mindedness may occasionally so result I do not deny, but I believe that the increased incidence of mental defectives in towns is to a great extent apparent only, and is due to the inclusion of a number of children who are not aments at all.

In examining school-children in both town and country, I have often been struck by the fact that the ill-washed, ill-clad, and ill-fed—in short, the victims of faulty environment—were not as a rule the mental defectives. In fact, such children were often alert and quick-witted beyond the average, although probably by no means keen on book-learning. This fact led me somewhat to discount environment as being a frequent cause of amentia. Next, in examining certified mental defectives in special schools, I discovered a proportion of cases which I had no hesitation in saying were not aments at all, but merely suffering from backwardness,

and this caused me to make some inquiries as to the number of such children who *recovered*.

Now, the essence of mental defect is that it is incurable, and by no "special" education, however elaborate, can a case of amentia be raised to the normal standard. Some defect must always remain, and upon this fact all authorities are agreed. When, therefore, it is found that a proportion of the urban defectives attending special schools are returned as cured to the ordinary schools, it is clear that an error of diagnosis has been made, and that they were not defectives. The proportion so returned varies very much in different towns, and in many the special classes have not been established sufficiently long to form a reliable test. The following is the percentage (of the admissions) of "mentally defective" children who have so far been returned *cured* to ordinary schools in some towns in which I made inquiries: Birkenhead, 6 per cent.; Bradford, 15 per cent.; Bristol, 3 per cent.; Derby, 5 per cent.; Leeds, 2 per cent.; Leicester, 20 per cent.; Liverpool, 4 per cent.; London, 10 per cent.; Nottingham, 10 per cent.; Plymouth, 8 per cent.; Sheffield, 4 per cent. I think these figures show conclusively that a varying, and in some cases considerable, proportion of the town defectives are not aments at all. On this point I may quote the opinions of two physicians who have had large experience of these children. Dr. Evan Powell, of Nottingham, writes: "I agree with you that a large number of so-called defectives are in reality not so, but are merely suffering from temporary arrest." And Dr. Ralph Crowley, of Bradford, writes: "I have no hesitation in saying that, where many go back, the reason is to be found in the fact that the children in the first place belonged to the 'merely dull and backward group.'" In the course of his evidence before the Royal Commission, it was stated by Dr. Eichholz, H.M. Inspector of Special Schools under the Board of Education, that, according to his observations, from 40 to 50 per cent. of the cases classed as "feeble-minded" recovered under care and training!

I shall have occasion to refer again to these cases of delayed development, which simulate mental defect, in speaking of diagnosis; but I have thought it well to allude to them here for the reason that the neglect to distinguish them may cause totally erroneous views as to the increased prevalence of mental deficiency in towns, as well as of its cause and its possibility of cure. It seems

to me probable that the real incidence of defect in town is not much, if any, greater than in country districts.

With regard to the **social status** of these children there is little to be said. The labouring classes have no monopoly of mental defect, and, although I am unable to give any actual figures, my general impression is that it is just as prevalent amongst the upper as the lower classes of this country.

With regard to **sex**, there is a considerable preponderance of males, the relative proportion of boys to girls being practically as three to two.

Description.

Mentally defective or feeble-minded children differ greatly in the degree of their deficiency. The lower members of the class closely approximate to, and cannot be distinctly separated from, the imbeciles. The higher members, on the other hand, are but little removed from the merely dull and backward of the normal population. It is therefore clear that no general description can be given which would be applicable to every mentally defective child; but the following are the chief characteristics of the class. Illustrations of the milder degrees are shown in Plate II.

Physical Condition.—A small proportion of children suffering from mental defect would pass muster as normal if their diagnosis rested upon inspection only; but such cases are exceptional, and the majority present unmistakable anomalies of bodily structure or function, as well as of mental development.

Anatomical anomalies, or so-called stigmata of degeneracy, are usually neither so plentiful nor pronounced in the feeble-minded child as in the imbecile or idiot; nevertheless Dr. Lapage, as a result of his examination of 200 children, found such to occur in no less than 90·5 per cent. of the total number examined. The defects were usually in combination, and in 23·73 per cent. were triple. In my experience the cranium is the most common site of defects, and I believe it to be abnormal either in shape or size, asymmetrical, bossed, or ridged, in fully half of these children. When the child first comes to school, and between the ages of seven and ten or twelve years, the maximum circumference is usually about half an inch less than that of a normal child of corresponding age and sex; but this discrepancy becomes more and more marked, and by the fourteenth or sixteenth year the difference may be as much as an

MENTALLY DEFECTIVE SCHOOL-CHILDREN.

FIG. 10.

FIG. 11.

FIG. 12.

FIG. 13.

FIG. 14.

FIG. 15.

To face page 1023.]

inch, or even more. Next in frequency to the cranium, anomalies of the palate are found; whilst malformations of the external ear and of the eye and its appendages occur a little less often.

Inquiries will nearly always show that in these children dentition, standing, walking, and speaking have been abnormally delayed. It may be four, five, or even six years before the child says a word. This retardation continues with advance in years, so that at every period of its school-life the mentally defective child compares unfavourably in its bodily growth and acquirements with the one of normal intellect. Moreover, the bodily functions are often imperfectly performed: the circulation is feeble, so that chilblains and sores are frequent in cold weather; assimilation is defective, consequently the child remains thin and ill-nourished; the vitality generally is diminished, and catarrhs and ill-health are exceedingly common. It was ascertained by Dr. Ashby that the children in special schools at Manchester averaged 2 to 4 inches less in height and 3 to 12 pounds less in weight than the normal. To some extent this may be due to the nature of the environment in these cases. As already stated, the home conditions of the feeble-minded are often very faulty, and I have usually found that the defectives in the country are sturdier and of better physique than are those in the towns; but this is not the full explanation, for the same applies to normal children, and, whatever their situation, mentally defective children compare unfavourably with their mentally sound fellows.

Abnormalities of Nerve Action are very frequent. In some children there is a general diminution of activity, and such are heavy, stolid, tardy in response, and laboured in all their movements. In others the reverse is the case, and all movement is in excess. Such children cannot sit or stand still; they are distracted from their task by every little thing around them, and they are often full of "tricks" and "habits." Co-ordination of movement is slowly and laboriously acquired. The making of pothooks and hangers presents difficulties unknown to the ordinary child, and paper-folding, card-pricking, and the simple kindergarten occupations are in the first instance performed with a laborious clumsiness. Many of the milder defectives, as a result of special training, do learn to use their hands extremely well, but even these rarely acquire the degree of dexterity attainable by an ordinary child who has been similarly trained. In some instances speech is accompanied by "spreading" action,

as seen in corrugation of the forehead, grinning, and at times twitching of the whole body.

The net result of these anomalies of nerve action is a peculiarity of balance, movement, and physiognomical expression which is exceedingly characteristic of the class, and which frequently enables the expert to detect mental deficiency at a glance. The expression varies from a look of heavy, immobile stupidity and vacuity, which is chiefly seen in those lacking in action, to a general restlessness and inattention to the subject in hand, often accompanied by spasmodic twitches, tricks, and habits, which is characteristic of those in whom action is excessive.

Speech, as well as being late in making [illegible] arance, is defective in fully one-third of these children. [illegible] rarely lacking entirely, although the speech of some ch[illegible]efore training, is so imperfect as to be quite unintelligible to a stranger. The chief defects consist of a thickness and indistinctness of utterance, an imperfect articulation of consonants, and (rarely) stammering and stuttering. The former of these conditions is partly attributable to abnormal configuration of the palate, lips, jaws, or pharynx, and partly to a general brain inertia and inability or unwillingness to make the effort necessary for distinct enunciation. The consonantal defects are due to similar causes plus a want of co-ordination. It may be remarked that inability to pronounce, not one in particular, but *many* consonants, is very commonly indicative of mental deficiency.

Mental Condition—*Sensation*.—In a small proportion of these children sensation is imperfect by reason of disease or anomalies of the peripheral or central organs; but on the whole serious sensory defects are not a prominent feature of the feeble-minded degree of amentia. Defects of hearing (which are generally due to disease of the middle ear) are present in about 8 per cent., and defects of vision in about 15 per cent., of cases. Colour-blindness, although in many cases seemingly present, is not in reality any more common than in ordinary children.

But there is a great difference in the educability of the perceptive faculties of feeble-minded children. The ordinary healthy child possesses an initiative and enterprise which brings him into daily contact with sights, sounds, and impressions of every description. His faculties of attention and curiosity cause him to observe, smell, and handle everything he meets, and in consequence the range and

delicacy of his sensorium soon becomes very considerable. The feeble-minded child is defective in many of these qualities; consequently the development of his sensorium has to be aided and encouraged by special means, and until this has been done his power of sensory discrimination is decidedly inferior to that of the normal child of similar age. I have frequently observed that, upon their admission to a special school, the sensory capacity of defective children is comparatively obtuse, and that they have little ability to discriminate between sensory impressions of the same order, but of slightly differing intensity. Under suitable training much of this is remedied, and the sensory functions of many of the milder types who have been thus trained do not seem to be much inferior to the normal. But the lower types are lacking in this power to develop, and in them the most persistent special training fails to bring the sensorium up to the normal level. In this latter class the organic sensations of pain, cold, hunger, and discomfort are also somewhat obtuse, but these do not appear to be so much affected as do the special senses.

Attention.—In the lethargic, inert type of feeble-mindedness there is a defect of spontaneous attention; but this is never so marked in this degree as in the more serious grades of amentia. The general stir and excitement aroused by a visitor is much more pronounced in the special school than in the imbecile ward. On the other hand, active or voluntary attention is commonly in defect, both with regard to its intensity and its duration. The most trifling thing serves to distract these children from their occupation, so that even where the attention is readily gained, it is with difficulty held. Many of them become capable of pursuing a congenial task with a certain amount of patience, but the majority have neither sufficient power of concentration or will to be capable of sustained mental effort against inclination or interposed obstacles. They must go with, for they cannot fight against, the stream; and this lack of will-power and driving force is one of the most distinguishing characteristics of aments at all ages.

School-teachers often complain of the lack of *memory* of these children, and if this faculty is to be judged by their inability to remember items of scholastic knowledge, there would certainly appear to be a decided deficiency. Some of them have very great difficulty in connecting a word with a thing, or in recognizing a printed character or numeral as the symbol of a concrete object or

number of objects. It is the same with colours: many can match colours perfectly well, thus proving that their colour-sense is not defective, and yet they may constantly confuse the *names* of colours. It is probably this which has given rise to the impression that colour-blindness is common amongst them. It is not to be expected that such a child would remember historical or geographical data, but the defect seems to be rather one of association and comprehension of the abstract than of memory proper. In the tenacity of their memory for things which are really understood, I have been unable to satisfy myself that feeble-minded are at all inferior to normal children, and many of them retain items of knowledge which have been demonstrated by concrete examples, as in object-lessons, remarkably well.

As a class, mentally defective children are imitators rather than originators. They may faithfully reproduce, but they rarely create, and their faculty for evolving new ideas—*imagination*—is decidedly lacking. But some of them evince considerable cunning in the commission of misdeeds, as well as no little ingenuity in the invention of lies to escape the consequences; and in many there is abundant evidence of the existence of the day-dreams and flights of fancy which figure so largely in the mental life of the normal child. I have often seen them look forward with delight to the approaching Christmas-tree, and several of my little patients have taken me into their confidence in recounting their ambition to be a judge, soldier, sailor, policeman, or engine-driver. Nevertheless, the fact remains that in constructive imagination and inventiveness there is usually a considerable defect.

Control is very feebly developed in these children, and action is always along the line of least resistance. Volition is by no means absent, but their behaviour is more often the result of sudden desires and impulses than of deliberate purpose. They are capable of such simple feelings as pleasure, pain, fear, astonishment, anger, surprise, and the like; but their emotions, like their sensations, are usually weak and evanescent. They are rarely stirred by hate, indignation, anguish, awe, or a consciousness of the sublime. They are readily amused by anything ridiculous and touched by anything pathetic; but they have little real sense of humour.

All of them are lacking in the logical, and most of them in the æsthetic, sense. In a small proportion there is, in addition, a marked deficiency or perversion of the moral sense, and such will

lie, pilfer, and generally misconduct themselves, without the slightest compunction. Some of this type are exceedingly cunning, and a few are guilty of acts of marked cruelty to other children or to dumb animals. They will also make utterly unfounded accusations with a considerable amount of detail and appearance of truth. On the other hand, there are many who are contented, obedient, well-behaved, and affectionate, and they may even possess a tolerable conception of their moral and religious obligations. Some are capable of understanding and being influenced by simple theological doctrines, but on the whole the religious sentiment in these children is of a decidedly poor order.

Scholastic Acquirements.

All these children are greatly improved by suitable training, but their developmental capacity and response to education vary enormously. On this account it is convenient to divide them into three grades.

The **first grade** is composed of children who make tolerable progress in elementary school knowledge. They are capable of writing a simple letter, they can read children's books, and they can perform simple arithmetical exercises mentally, as well as the first four rules on paper. They have a knowledge of money values, and they can be trusted with simple commissions. I have known some of them do a quite creditable examination paper confined to simple facts in history, geography, scripture, etc.; but further examination showed that it was chiefly "parrot knowledge," and that they had really very little understanding of the answers they had put down. Their handiwork is often extremely good, and they do little drawings, brush-work, cutting-out, basket and wicker work, rug-making, and the like, with a dexterity which is often surprising. They have some common sense, but they lack resource and judgment and often initiative.

The **second grade** fall considerably behind the former in purely scholastic attainments, and also, although not to the same extent, in handicraft. They are rarely capable of mental, and seldom of paper, arithmetic, and their reading and writing ability extends no further than simple words of one syllable. Some are even unable to do this.

They can perform the same kind of manual work, but the result

is not nearly so good, and they require more constant stimulation as well as much closer supervision. They have decidedly less general intelligence.

The **third grade** form a connecting link with the imbeciles, from whom, indeed, they are but little removed. The improvement effected by the special school is limited to the development of some capacity for manual work under supervision, and to the formation of habits of obedience, tidiness, and regularity. Their scholastic acquirements are practically nil.

As a concrete example of the difference between mentally defective and normal school-children, I may give the following brief account of the pupils attending a typical "special" day-school under the London County Council.

This school* contains over sixty defective boys and girls, who are divided into three separate classes, each under a mistress. In the *lowest class* the average age of the children is from eight to nine years, the youngest being seven and the oldest about twelve years. In age, therefore, they correspond approximately to normal Standard II., in which the school-work consists of—*Reading* equivalent to Æsop's "Fables." *Writing:* transcription and dictation equal to the same. *Arithmetic:* tables up to 12 × 12; pence table; compound addition, subtraction, multiplication, and division; four simple rules and problems introducing two or more rules at one time. *Drawing:* simple freehand; use of ruler and set-square. *Geography*. *History*. *Object-lessons* in animal and vegetable life and simple science.

The work actually done by the defective children in this class consists of recognition of letters of the alphabet and reading words of three or four letters; transcription of the same from a blackboard copy; recognition of simple numerals, and writing the same from dictation; simple addition up to ten and simple subtraction of single figures. None are capable of writing from dictation, and all sums are done in the concrete by means of beads or tablets. In addition, the children are taught the use of the ruler; they learn simple paper folding and cutting, brush-work, and rough clay modelling. They also engage in musical drill and games.

The average defective child takes two years before he or she becomes proficient enough to be passed out of this class. Some

* Goodrich Road Special School, East Dulwich, S.E., in the charge of Miss N. Mumbray.

never do attain to this proficiency, although they may be moved up on account of their size. A few are sufficiently advanced to be transferred after six months, but I am of opinion that the majority of these are not really defective, but merely dull and backward.

In the *middle class* the average age is from ten to eleven, the youngest being eight and the oldest sixteen years. It thus corresponds to normal Standard IV., in which the work consists of—*Reading* from Geographical, Historical, and Literary Readers. *Writing*, the same, with short essays and letter-writing. *Arithmetic:* simple exercises in money, time, weights and measures; simple vulgar and decimal fractions. *Geography*, *History*, *Grammar*, *Object-less* , and *Drawing*, all more advanced.

The work actually done in this class is reading simple words of one and two syllables from Infant Reader I.; transcription and dictation in simple words of one and two syllables; addition, in the abstract, of simple numbers up to 100; subtraction of tens and units; simple multiplication and, rarely, simple division by one figure. The occupations consist of rather more advanced brush-work, paper-folding and threading, cutting paper in the form of leaves for flower-making, and clay-modelling. The average time spent in this class is about two years.

In the *highest class* the average age is twelve years, the youngest being ten and the oldest nearly sixteen. One-fourth of the pupils are over thirteen. They thus correspond in age with Standards VI. and VII., in which the school-work consists of—*Reading* from more advanced Literary, Geographical, and Historical Readers. *Writing*, the same, with short original essays on geographical and historical topics. *Arithmetic:* simple and compound practice; problems in greatest common measure and least common multiple; the first four rules in vulgar and decimal fractions. *Grammar*, with analysis and parsing. More advanced *History* and *Geography*. *Geometry* and *Model-drawing*. Elementary lessons in *Physics* and *Chemistry*.

The work done by this class consists of reading and writing, equivalent to normal Standard II.; compound addition and subtraction up to 1,000, and simple multiplication and division. Excluding a few children—who, in my opinion, are not really defective—it may be said that the scholastic acquirements of none of these children come up to normal Standard II. In occupations and manual work they are decidedly better, and a considerable

proportion of the children in this class can cut out and make simple artificial flowers, knit rugs and weave baskets, with a really very creditable amount of dexterity, which redounds in no slight measure to the patient, persevering, and systematic care of their teacher.

With the object of testing their capacity for attention, memory, and general comprehension, Miss Mumbray was good enough to place for me a collection of twelve small articles, such as a pencil, tape, bottle, scissors, etc., on a board, and let the children look at them for two minutes. The board was then removed, and the children given ten minutes in which to write down, either in words or graphically, the things they had seen. Out of eighteen competitors, all but one found it easier to draw than to write the names of the objects; five children remembered the whole twelve articles, four remembered eleven, four ten, one nine, one eight, two seven, and one only five. In the majority of the children the drawings were sufficiently good to enable me to readily recognize the several objects for which they were intended, whilst some were really excellent.

There is no doubt that, for the majority of these children, a residential school produces far more satisfactory results than does a day-school. For the pupils in the former are under more constant supervision, and can receive instruction in dressing, feeding, personal cleanliness and tidiness, which have the utmost educational value. Moreover, they make more definite companionships, and stimulate one another during play and work in a way which is impossible at a day-school. One of the earliest residential schools of this kind is Littleton House, at Uxbridge, established in 1902 through the energy, and to a very great extent personal generosity, of Miss Douglas Townsend, whose labours in connexion with the feeble-minded are well known. This school contains twenty-four boys, ranging in age from seven to sixteen years. The scholastic work done is similar to that already described, but in addition the boys have a good-sized garden, in which each has his own little plot to do exactly as he likes with. There is a carpenter's shop, where they learn to make many useful articles, and several of them keep and look after pet animals, whilst under the direction of the matron they learn to do most of the house-work, in which they take a keen delight. Miss Townsend and the managers fully recognize that defective children learn more through their hands than through books; consequently manual instruction is a very important feature

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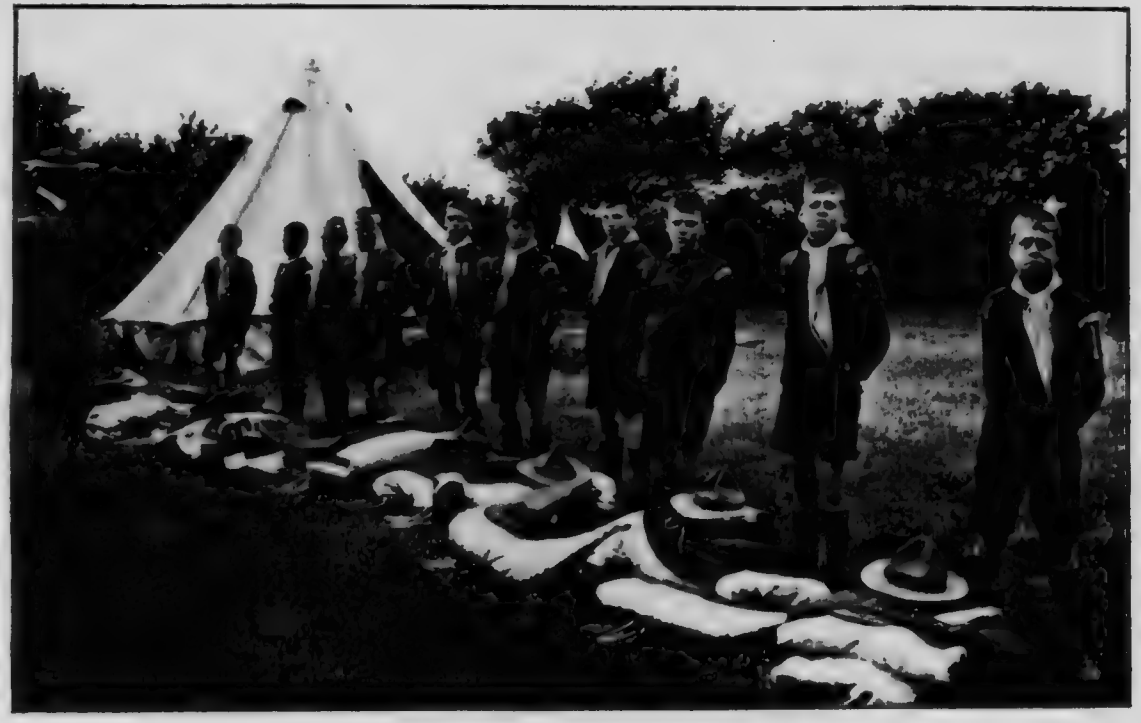

FIG. 16.—The Littleton House Troop of Scouts.

of the school, occupying half the working-day and being superintended by a special manual instructor. In addition to this, the boys are trained to go messages and execute simple commissions, which most of them soon learn to do very faithfully. But the most noteworthy feature of the establishment, and one which I certainly think has proved of extraordinary educational value, is the formation of a troop of Baden Powell Scouts, for the inception and running of which the school is indebted to the able master, Mr. R. Parkinson. This troop goes into camp for a period of four weeks each year, during which the boys are not only thoroughly well behaved, but pitch their tents, cook their food, and engage in drills and long route marches, just the same as an ordinary troop. Mr. Parkinson has even organized a combined drill and gymnastic display which has been publicly performed on many occasions with great éclat. There was some little difficulty in obtaining official recognition of the troop in the first instance, but of the twenty-four boys, there are twelve who now hold naturalist's badges, three patrol leaders, three second-class scouts, three with bugler's badges, three with carpenter's badges, and two cooks. It must be admitted that the moving spirits of the troop are two or three boys, who, although coming within the definition of the Act in their inability to profit by ordinary school instruction, have now improved to a very great extent, and are probably not really aments; but the remainder have been by this means not only greatly improved in their physique, but have developed attention, observation, and keenness, have learned discipline, and have made great strides in general mental development and in the capacity for concerted and co-ordinated action as component individuals of their own little community. I regard it as an experiment in the education of mentally defective children which has been attended with conspicuous success (see Plate III.).

Such are the chief abilities and disabilities of mentally defective children. They differ, however, not only in the degree of their deficiency, but also in their temperament, disposition, and general behaviour. In fact, they possess individuality just as do normal children, although this is not as a rule a pronounced and dominating feature until after puberty. Moreover, there are certain readily recognizable clinical types of these children, just as there are of aments in general, whilst superadded complications are not uncommon. The great majority suffer from primary amentia, and

although most of these are of the simple variety, between 5 and 10 per cent. are microcephalics, about 2 or 3 per cent. macrocephalics, and about the same number are of the Mongolian variety. In probably about 10 to 15 per cent. of these children the amentia is of the secondary form, most of them being of the vascular or post-febrile varieties. In a small proportion of these some degree of paresis or paralysis is present, although this is neither so prevalent nor so severe as in the imbeciles and idiots. Another small proportion are cretins, and in a still smaller number there is evidence of syphilis. Indications of rickets are not uncommon, whilst in about 10 per cent. of cases the feeble-mindedness is accompanied by epilepsy.

But whatever the particular features may be, there is one quality which characterizes all the varieties and grades of these children, and that is their inability to swim against the stream, or even to keep their heads above water, without the assistance of some kindly hand. Whilst the ordinary child of fourteen or sixteen years has not only a considerable knowledge of common things and events, but has in addition acquired notions of qualities and conceptions of the abstract; whilst he has developed the faculty of comparing, relating and judging between these conceptions, and of tracing a connexion between cause and effect; whilst his mind now enables him to take an intelligent interest in his daily work, and allows him to shape plans for his future; whilst, in short, he has learned to put away childish things and has become capable of standing alone—the mentally defective one of similar age is still happy with his toys, and his whole behaviour and conversation still indicate the infantile and imperfect character of his mind. Bodily and mentally he is always in arrears, and with each advancing year his intellect is left farther and farther behind that of his more fortunate fellow. His special training has done much for him, in so far as it has inculcated habits of regularity and conformity to the will of others; further, and more important, because it has converted him from a useless, and often dangerous, member of society into one capable of some amount of useful work. But this latter can only be accomplished under supervision, and the future of the feeble-minded child, as he passes out of the door of the school for the last time into the great world beyond, will entirely depend upon how thorough and careful this supervision is.

CHAPTER IX

FEEBLE-MINDEDNESS IN ADULTS

Definition.—The term *feeble-minded person* is applied to an individual suffering from the mildest degree of amentia who is over the age of sixteen years, those under this age being known as "mentally defective children."

The definition suggested by the Royal College of Physicians of the feeble-minded person, and adopted in a former edition of this book, was "one who is capable of earning a living under favourable circumstances, but is incapable, from mental defect existing from birth or from an early age, (*a*) of competing on equal terms with his normal fellows, or (*b*) of managing himself and his affairs with ordinary prudence."

This, however, has now been superseded, and the legal definition as given in Clause I. of the Mental Deficiency Act of 1913 is:

"*Persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their own protection or for the protection of others.*"

Number.—The inquiries of the Royal Commission show that about 40 per cent. of all aments in this country are feeble-minded persons, and I have calculated that in England and Wales on January 1, 1906, their approximate total was 54,114. This number is rather less than half the total insane on the same date, and corresponds to 1·57 feeble-minded persons in every 1,000 population. But the incidence is not uniform throughout the country; it varies directly with the prevalence of mental abnormality in general (which is subject to a very considerable range of variation); it also differs according to the environment. The prevalence in the respective areas investigated has been shown in Tables I. and IV., pp. 12 and 16, from which it is seen that the feeble-minded adult,

both absolutely and relatively, tends to be commoner in agricultural than in urban districts.

The cause of this is not at first sight clear, for these persons are but grown-up defective children, and this latter class is apparently much more numerous in the towns than in the country. As I have shown, however, there is good reason for thinking that a large proportion of the so-called mentally defective children of our towns are not defective at all, but simply suffering from delayed development; so that the real incidence of mentally defective children is probably not appreciably greater in urban than in rural areas. In addition, the increased competition of town life is decidedly unfavourable to the feeble-minded adult, and there is evidence to show that as a consequence a certain number of those born in towns are gradually squeezed out into the country.

Sex.—On the whole, males and females occur to about an equal extent, and the investigations of the Royal Commission show that, of a total of 4,291 feeble-minded persons, 2,179 were males and 2,112 were females.

Description.

Physical and Mental Characteristics.—It has been well said that "the child is father to the man," and in the main the physical and mental characteristics of the feeble-minded adult are similar to those of the mentally defective child; but a few points of difference must be noticed.

With regard to their *physical condition*, the anatomical stigmata of degeneracy of course persist, whilst defects of stature and general development tend to become even more noticeable as the years advance, in comparison with the normal adult. On the other hand, a certain amount of improvement of function has taken place, so that the bodily nutrition is better, and the proneness to ailments not nearly so marked. Nevertheless, the expectation of life in the feeble-minded is decidedly less than in the ordinary population. Improvement is also usually seen in nerve action, and although the diminution or excess of movement which characterized the child is still a feature of the adult, and the balance and carriage of the body are often still clumsy and ungainly, the adult has, with the practice resulting from years of experience, gradually acquired a certain amount of muscular control. As a consequence, the tricks,

habits, and often marked inco-ordination of the child are less frequently seen in the adult.

Similarly with the *mental condition*. A certain amount of *savoir-faire* is acquired by experience, and mental action generally may have been considerably improved by special training. But the capacity of these persons only extends to the things with which they are familiar, and they cannot rise to any work or circumstances outside their daily routine. They still show the same lack of observation and reasoning power, they have little ability to generalize or to apply their limited knowledge to new conditions, and their ideas still retain much of the crudity of childhood. It results from this that, although the feeble-minded adult may be, and often is, capable of useful employment of a routine nature under supervision, he is as a rule incapable of steering his own course, or even of providing for himself without some assistance. And when contrasted with a normal individual of similar age, his lack of mental capacity is even more prominent than in the case of the defective child.

On the whole, I think that the foregoing description is applicable to the bulk of the feeble-minded; but it must be remembered that there are many degrees, and that no account can be given which would fit every member of the class. This description is probably too flattering to some of the more pronounced defectives; on the other hand, to the highest types of all such an account may be somewhat unfair, for many of these are tolerably well grown and developed, and show little indication of their weakness if they are not scrutinized too carefully. Those of this mild grade belonging to the upper and wealthier classes—for poverty has no monopoly of feeble-mindedness—do not usually find the daily round of society beyond their capacity; they even marry or are given in marriage, and it is only when a situation arises which calls for management and judgment that their defect becomes patent. So long as they are under supervision they pass muster, but once let them take the reins, and chaotic disaster speedily results.

It is, however, rather in the matter of *character* that the greatest difference exists between the grown-up and juvenile feeble-minded. Ordinary persons approximate to one common type much more in childhood than in adult life, and although individual differences are observable from the first few weeks of life, they become much more pronounced about the age of puberty. So it is with the feeble-

minded. The advent of puberty often sees the evolution of habits and propensities which have the greatest effect upon the future life, and which have hitherto been latent. Possibly to a considerable extent these may be dependent upon the early environment and training, or absence of training; but heredity often plays an important part, as in the ordinary child. Whatever their origin, the mental defect and lessened power of control of these persons tend to bring these habits and propensities into extreme prominence.

These propensities are many and varied, and from the point of view of administration they demand the closest attention. Indeed, I would go so far as to say that, in dealing with the feeble-minded, there could be no greater administrative blunder than to treat mental defect in the abstract, and pay no regard to these peculiarities of the individual. Some feeble-minded persons are placid, well-behaved, and industrious; others are perfectly harmless, but possess pronounced wandering proclivities; others are exceedingly facile; whilst yet others have a strong predisposition to insanity or crime. On the whole, I think that all of them may be divided into two main classes, according as their mental equilibrium tends to be stable or unstable, and these we may briefly describe.

Feeble-minded of Stable Mental Equilibrium. — Many feeble-minded persons are quiet, placid, inoffensive, and good-natured individuals who go on their way comparatively unmoved by the happenings of life. They are not insensible to pleasure, and they evince a certain amount of delight, just as would a child, at a theatre, a circus, the sight of a company of soldiers, or the like. They are also conscious of, and affected by, praise, rebuke, or ill-treatment; but their joy or sorrow is neither excessive nor of long duration, and their general demeanour is that of happy placidity. The mental constitution of such persons is in striking contrast to that of the class we shall next consider, and they may be appropriately designated as of stable equilibrium. I can give no precise figures, but my impression is that this type comprises about 30 to 40 per cent. of all the feeble-minded. Owing to the present lack of organization for providing these persons with suitable employment, a considerable number of them are idle, and spend their time roaming the villages and country lanes; but most of these will cheerfully carry a parcel or do any odd jobs they may be asked to do, and those for whom continuous employment is found prove

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FIG. 17.—A feeble-minded youth of stable mental equilibrium.

FIG. 18.—A feeble-minded youth of stable mental equilibrium.

themselves to be steady, industrious workers. Illustrations of this type are shown in Plate IV.

In the country a certain number of them are employed upon the land in some simple capacity, such as helping with the hay or corn, the plough or roots, scaring the birds, or bringing up the cows; and although they cannot be trusted to do the full work of an agricultural labourer, they often take the place of a boy to the satisfaction of their employer, and they are quite worth their keep and the shilling or two a week they receive. It is probable that most moderate-sized villages possess at least one of these "softies," "naturals," "dafties," or "not exactlies," as they are called; and although they are at times made fun of by the urchins of the place, they are not, as a rule, unkindly treated. In the towns, on the other hand, this type is not nearly so common. Such persons may occasionally be seen selling newspapers, distributing bills, hawking firewood, or doing odd jobs for some charitably disposed person; but the increased competition of town life is decidedly against them, and they rapidly tend to be squeezed farther afield or to gravitate into the workhouse or some charitable institution.

The life of these persons is one of conformity to habit, and not to ideals. They rarely think of, much less make plans for, the future; and the few who have vain imaginations as to what they would like to do or become are lacking in the necessary intelligence or will to direct their actions accordingly. Indeed, one of the most pronounced features of the feeble-minded person is his utter lack of purpose. If given work and told exactly what to do, he may often be trusted to do it; he may even acquire the habit of performing the same task day after day, year in and year out, without supervision. But the work must be strictly of a routine nature, for he would be quite unable to cope with any unforeseen occurrence. And should he lose his employment, he is incapable of any strenuous attempt to seek more. To use a homely phrase, we may say that the bread of these persons must be put into their mouths.

The following are fairly typical illustrations of this stable type of feeble-mindedness:

A. C. is a man of twenty-two years, although he looks only about seventeen. He went to an ordinary elementary school, and was in the sixth standard when he left; but his schoolmaster tells me that he was only moved up each year on account of his size and age, and that his scholastic attainments were really only equal to

Standard III. During the two years following school he had several situations, mostly as errand-boy, but he was discharged from each place in turn on account of general incompetence. Then he was taken, largely from philanthropic motives, into a printing-office, and there he has remained until the present time. His work is purely mechanical, and consists in helping a man with the machine, carrying bales of paper, and so on. He began with a wage of nine shillings weekly; this has been increased, and he now has a standing wage of eleven shillings, but he often puts in overtime, and he usually earns about thirteen shillings. He lives at home with his parents, and he gives his money to his mother, who allows him a shilling weekly as pocket-money. When clothing or boots are required, his mother buys them, and, in fact, he is treated exactly as a child. He is perfectly happy and contented with his lot, and has no ambition to be other than what he is; but it is difficult to say what is going to happen when he has no home to go to and no parents to look after him. I asked him if he had ever thought of getting married. He said: "No." I asked him if he ever kept company with anyone. He said he did for a time, and used to "walk out" with a girl every night. To my questions as to what he used to say to her, he said: "She used to ask me how I was getting on at my work. I said: 'Pretty fair.' I used to ask her how she was getting on at her work. She said: 'All right.'" There do not appear to have been many love-passages, for he admits that he never kissed her. After six months the maiden tired, and she now walks out with one of his more enterprising mates. This youth once conceived the desire to join the Volunteers, and applied to the local non-commissioned officer. The Sergeant-Major, a shrewd man and a good judge of men, rejected him, and, when I asked if he didn't come up to the physical standard, said: "His body was all right, sir; but he had too little brain-pan." He has a few stigmata, can read and write tolerably well, and can do simple sums; he can also copy drawing very creditably, but he has little other knowledge. After a good deal of consideration, he told me that history was "what happened before," and that geography was "about towns and rivers," but he has no historical or geographical knowledge. I asked him which was the first war that he learned about. After much cogitation he said: "It was near Trafalgar Day. It was when Nelson fought. He defeated the Spaniards." On being asked how long ago that happened, after a

very long pause he said: "From then to now, do you [illegible]?" and, on my replying in the affirmative, said: "Ah [illegible] hundred." His knowledge of geography was of the same order, and although he told me he had got a Sunday-school prize, to my query as to who God was he replied, after much thought: "The Son of man."

Frank C. This patient is the son of a country gentleman, and was mentally and physically backward from birth. He did not walk until in his fourth year, and did not talk until turned five. During the whole of childhood he was exceedingly delicate, nervous, and excitable, suffering constantly from asthma, bronchitis, and laryngismus. He went to a private school at the age of eight years, but never got on; he was tried at several other schools, but was found incapable of making scholastic progress. During his ninth year he began to masturbate, and he has practised this constantly ever since. At twelve years of age he was placed for a time in the house of a mental specialist. From this he was removed to be boarded out with a clergyman for two years; but was taken away because his parents thought his host was inculcating too much ritualism. He was then boarded out with a farmer for a period of five years, and spent his time helping with the cattle, horses, and farm-work generally. In this situation he seemed to improve so much that he was brought home with the idea that he might now remain and potter about on his father's estate. After being home for a few months, however, he caused general consternation by suddenly announcing his intention of marrying one of the maids in the house. He had said nothing at all to the girl, who seemed exceedingly quiet and respectable, and had not encouraged him in any way, and the first intimation of his feelings was the receipt by the girl's mother of the following letter:

October 1st 1910,
Saturday.

Dear Mrs. S——,

I am writing to inform you that I intend to have your daughter Fanney to become my wife and I sencerely hope that you wont refuse me you may be quite sure that I shall take great care of her and I promise that she shall have all that she wants as far as our means will let us But I give you fair warning that if you refuse me I shall take her without your consent as I am determent to have Fanney my people will make a big row over this but you must take no notice of that but be

equality determent for me to have her if anything is said about it Believe me to be yours sencerely

Frank ——.

Fanney knows me quite well as we have seen each other at home. By this mark I promise to do all that I have said in this letter.

(Two blobs of sealing wax here.)

Whatever may happen nothing shall part us but death and that only.

At the same time the vicar received the following:

October 1st, 1901o,
Saturday.

Mr. W——.

Dear, Sir

Will you kindly call my bands between Miss Fanney S—— of B—— and Frank C—— of ——. If you refuse to call it I shall find some other means of having it done or I shall get some one else to all it in the Church as I am determent to have it done. If you want to know anything more go to Mrs. S——

Yours sencerely

Frank C——.

These letters caused no little consternation, and on the advice of the family doctor the parents brought the youth to see me. I found him a small, but well-nourished, ruddy-faced young man of twenty-four years, somewhat ungainly in body balance and walk, but presenting no marked stigmata of degeneracy. He talked freely and pleasantly; his memory, attention, and capacity for observation were average; but his reasoning was very poor, and his ideas and mode of expression were decidedly childish. It was obvious that although he knew how to do certain routine farm jobs, such as looking after the cows and horses, attending to the fowls, digging up potatoes, etc., he had no idea of managing a farm or of looking after his affairs. During our conversation he said that he was not very particular about getting married just yet, but he was rather fond of Fanny. When I asked him how he could support her, he said he thought he would get a job like her father, who was his father's coachman. On my pointing out that even if he succeeded in doing this it would still be some time before he could

keep a wife, he readily agreed, and at my suggestion said he would write to the girl's parents and clergyman saying he had decided not to marry yet. I found that every attempt had been made to educate him up to his social position as a country gentleman; but he was quite incapable of this, and infinitely preferred living and working with the farm labourers on his father's estate. At my suggestion he was sent to a farm run by a medical man, where he now remains quite happy and contented.

Lizzie S—— is the first and only child of a respectable couple who are lodge-keepers on a large country estate. I can find nothing whatever in the family or previous personal history of a causal nature; but it must be admitted that the parents are able to give very few details of their relatives. The mother says that Lizzie seemed different to other people's children when she was seven months old. Whilst other children "would be wriggling about, trying to get down and want a lot of looking after, Lizzie was always so quiet and so good, never anything seemed to put her out, and she had no temper at all." She cut her teeth about the usual time, but was very late in standing and walking, and did not talk until she was three years old. Up to the age of six years the mother thought she would grow out of it, but when she went to school she never seemed able to learn at all, and serious doubts began to enter the mother's mind as to her intellect. The schoolmistress would not keep her at school, and she remained at home with her parents. She was always quiet, obedient, and well behaved, but at the age of eighteen she evinced a fondness for young men, and as her mother felt that they could do anything they liked with her, she sought advice as to her condition.

On examination at the age of eighteen years, I found her to be a pleasant-faced, smiling girl, somewhat shy and hesitating in manner and feeble in expression. Her physical development corresponded to that of a girl of about fifteen, and signs of puberty had just appeared. She sat quietly in the chair, attended to all I said to her, and was not distracted by passing events. Her cranial circumference was 20 inches. She knew her name and age, and when her birthday was. She said London was a "big town," but did not know how much bigger it was than the village she came from, but "perhaps it is twice as big." She said the sun was up in the sky, not very far away, not so far as her home, it would not take her long to get there if she could fly. If anyone came and said they would

take her a trip to the sun in a flying machine she would go with them. She would go with one now, and said she would be back in time for dinner. I showed her a model of a cow. She looked at it and said it was a lamb; but on being told to look again, said "Cow." Upon asking her what cows were for, she said, "To milk." Upon being asked what milk was for, she said, "Drinking," and on my asking her what else, after a very long pause she said "Cooking." I asked her suddenly: "What do you clean your boots with?" and she at once replied: "Blacking." She said she went to church where they teach her "hymns, psalms, and about Jesus." But she could not tell me a single fact about Jesus, and was not sure whether He is dead or alive. She said she could wash clothes. She washed them in water. I asked her what else. She said: "The bath." She could not tell me what else she would put in the water. "Nothing else—plain water." When I suggested soap to her she smiled and said: "Yes." "What kind of soap?" "Sunlight," promptly. I asked her to describe a fork to me. After much hesitation she at length said: "It's steel," and this was all I could get out of her. She knew the names and uses of most common objects, but could tell me no points of difference between paper and cloth. She answered the first nine of the Binet-Simon problem questions, but was unable to answer those following. She said that $4+3=6$; $2+3=4$; $5+1$, no answer. She did not know how many pennies there were in a shilling, but after much pressing and hesitation said that there are two shillings in a two-shilling piece, and she took forty-five seconds before she could tell me that there were five shillings in a five-shilling piece. Her mother said that Lizzie could peel the potatoes, and could do a little plain knitting and sewing, but could not put a garment together; she could clean the grate and lay the fire, but this was about all, and even in doing these the mother felt that she must always keep her eye on her. If sent shopping she had no idea of change, and generally forgot to bring some of the things.

I regard this case as on the borderland of imbecility and feeble-mindedness. The girl has observation and attention, and can do many little things she has been taught to do. She has no school knowledge, and cannot read, write, or sum, and it is obvious that her association and ideation are poor and her judgment very faulty. But it is to be remembered that she has had practically no training, and I think it highly probable that had this been supplied she would

have made a most useful worker in a laundry or some similar occupation. She is obviously a case needing permanent supervision, and without this her facile disposition will inevitably lead her into trouble.

I am acquainted with a feeble-minded man, *John C——*, who has steadily and industriously cracked stones by the roadside for the past forty years. He lodges in the village with a labourer and his wife, and the latter wakes him in the morning, gives him his breakfast, makes his dinner into a parcel, and sends him off to work. When dinner-time comes, which he knows by seeing the labourers in the field leave off work, he eats the contents of his parcel. Sometimes John feels hungry, and eats it before. About five o'clock, which he also knows by the passing of the postman, he leaves off work and returns to his lodging. He has his tea, sits by the fireside until about eight, and then goes to bed. Occasionally John has been known to get tired of work and come home in the middle of the afternoon; but such lapses are very rare, and on the whole he is exceedingly methodical and industrious. He knows that Sunday is a day of rest, but he must be told that it is Sunday, or he would go to work as usual. John's landlord once played him the prank of not telling him it was the Sabbath, and he went off as usual without any suspicion. But he had intelligence enough to notice the trick on passing through the village, by seeing that the shop was closed, and he came back vastly amused at what he thought was a fine mistake. He receives a few shillings each week from the Rural District Council, and this he faithfully carries to his landlady, who allows him a penny now and then when he asks for it. This, however, appears to be seldom, for John seems to be in the happy condition of having all his wants supplied.

One might describe many cases similar to these, both in town and country; but it is unnecessary. They illustrate very well the stable type of feeble mind, and the manner in which routine work may be performed by this class with comparatively little supervision. I have even known several who have served their time in the army. It is necessary to remember, however, that their intelligence is limited, and that these persons must not be entrusted with work beyond their capacity, or the result may be disastrous. I may mention a striking example of this which occurred in the case of a feeble-minded woman resident in a workhouse. Her daily occupation was washing in the laundry, which she did very well.

But one day the charge-nurse of the maternity ward most unfortunately gave her a baby to wash. She did so in boiling water, with, it need hardly be said, a fatal result.

But although these persons are capable of useful employment, they have no capacity to lay out the money they earn or to manage their affairs. Food, clothing, and shelter must be provided for them, just as with children, and in the absence of someone to look after them they soon get into a most woeful plight.

As an instance of their general "incapacity to manage their affairs with ordinary prudence," I may mention the case of a woman I met in a small village in Somerset. She was the daughter of the village shopkeeper, and upon her parents' death had inherited sufficient cottage property to keep her in comfort for the rest of her life. Unfortunately, however, no one was appointed to look after her, and so it came about that little by little she was diddled, by relatives and acquaintances, out of every penny she possessed, and when I saw her she had been taken in out of pity by the wife of a labouring man, who received a few shillings weekly from the parish to look after her.

Throughout the country there are hundreds of feeble-minded persons, many of them gentlefolk by birth, in like case. As long as they are provided with a home, and have parents or relations to generally supervise them, things go well. They perform little household and outdoor duties, take up simple hobbies like poker-work, stamp-collecting, and amateur cabinet-making, and enter into the ordinary social amusements of the class to which they belong. Most of their friends recognize that they are not quite "all there," but they often pass muster with casual acquaintances. But once let them get away from the parental apron-strings, and assume the responsibilities of an independent existence, and their want of mental capacity is fully revealed, and results in their complete undoing. In the case of feeble-minded girls this general inability to take care of themselves is particularly evident, and demonstrates in the most forcible manner the urgency of the need for their protection.

Lastly, it may be said that, although the religious and moral sense of these persons is rarely of a high order, most of them are conscious of the difference between right and wrong, and of the fact that they have certain obligations towards their neighbours.

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FIG. 19.—A feeble-minded girl of unstable mental equilibrium; impulsive and deceitful.

FIG. 20.—A feeble-minded girl of unstable mental equilibrium—facile type.

PLATE V.

A certain number, indeed, are quite capable of understanding simple theological doctrine.

Feeble-minded of Unstable Mental Equilibrium.—It is not, perhaps, surprising that the mind which is defective should also lack balance, and in a very considerable number of feeble-minded persons—indeed, I think in the majority—the mental defect is accompanied by more or less mental instability. This may not become evident until the physiological epochs of puberty or adolescence have been reached, and one meets many cases in which the whole disposition of the individual seems to undergo an alteration at these times; but often the condition can be detected in childhood, and is shown by the fits of irritability, excitement, moroseness, sulkiness, or so-called "bad temper," which are present in a considerable number of defective children.

The degree of instability varies much in different individuals, and at different times in the same individual. Some are simply giggling, emotional, and impulsive, liable to sudden fits of waywardness, but readily controllable, and on the whole capable of doing useful work. I have known one of this type, a silly, giggling, weak-minded girl, to plunge her head into a pail of water without the slightest hesitation when the suggestion was made to her. I have known another to set fire to a hay-rick, and another to dash her hand violently through a window-pane in a sudden access of temper. And yet all of them, on the whole, were good, willing workers and in fairly constant employment (see Plate V.). I have seen girls of this type who have caused no little commotion by "faking" a burglary, even going to the length of gagging and binding themselves and giving a most detailed description of an imaginary desperado.

In others, however, the instability is more persistent, and the person is so changeable and undependable that continuous employment is out of the question unless the closest supervision can be maintained. The attacks of these persons often have much of the character of an epileptic seizure, the manifestations being mental rather than motor, however.

The following are illustrative cases of this unstable type of feeble-mindedness:

Alice S—— is a feeble-minded girl of nineteen years. She is the daughter of working people, and went to the Board-school until she was fourteen years of age; but her schoolmistress says she could

make nothing out of her, that when she left she could only just read and write, and that she was "always spiteful, untrustworthy, and a regular nuisance." Upon leaving school a situation as day-girl was found for her. She ran away on the third day, and refused to go back. Then she got another place, but only stayed a week, as her mistress "could not put up with her ways." This went on for over two years, during which time she had no fewer than twenty-two situations. She was then sent to a laundry training-home, and here for the first few weeks she was much quieter, and it was hoped that she would settle down into good habits. But the hope was futile. The matron found that not the slightest dependence could be placed upon her word, that she was dirty in her person, lazy, an incurable pilferer, and up to the most cunning tricks to annoy and irritate her companions. She was therefore sent home again. Here she remained for some months, doing no work, and causing her relations endless trouble and worry. On several occasions she was brought home by the police, and finally, within a year of her return from the training-home, she was admitted into the maternity ward of the workhouse. It was there that I first saw her, and although she was a strong, active girl, and quite capable of doing domestic work, she was nevertheless so erratic, impulsive, and generally irresponsible, that nothing could be made of her.

F. H., a feeble-minded man twenty-three years of age, having the appearance of a youth of seventeen or eighteen. He is 5 feet in height, and weighs 7½ stones, is thin and ill-nourished, and has numerous stigmata. He is extremely unstable, at times being quiet and well-behaved, at others noisy, restless, talking and laughing to himself, and interfering with those around him. In one of these fits he attacked his brother with a hammer. He has had several situations, but has been unable to keep any of them. He can read, write, and do simple sums, and although, when questioned, he seems to have a fair knowledge of many common things, he is too defective and unstable to turn his knowledge to any account. He is a ready talker when in the mood, and gives a very plausible account of himself. He says he is "what you call an orphan, and only has his brothers to be acquainted with now. Was in the sixth standard when he left school, and used to do reading, writing, arithmetic, composition, and geometry; was never at the top of the class —master used to think him a backward boy. It was writing from memory that was his worst subject; memory was always bad. Once

got a prize for religious catechism. Was in the boys' home learning printing for nine months, but they gave him the sack because he accidentally spoilt a special job. Has had other chances, but never seemed to get on very well. If they would only give him another chance he would do his very best. Several of the other people have interfered with him, and then, of course, he has to take care of himself. One of his masters told him he would get on better if he didn't allow himself to be put on, and looked after himself more."

Lastly, in another group of these unstable feeble-minded a condition of actual insanity is present; but as this is a complication of some importance, I shall deal with it in a subsequent chapter.

As already remarked, it is likely that a good deal of the mental instability of these persons is the result of an unsuitable environment in early life, and it is probable that careful and firm training during childhood might do much to prevent it. I am certain, however, that it is often inborn, just as is that instability of mental constitution in the "normally" developed which is so often the precursor of insanity; indeed, I am inclined to look upon all feeble-minded persons of this type as potential lunatics.

It is easy to understand that criminal actions may be committed by such persons, and there is no doubt that they constitute the great majority of feeble-minded criminals. Also, although probably not so often the case to-day, there is little doubt that in years gone by those of the facile type were frequently made use of to further the schemes of the professional law-breaker. It is not merely that these persons are incapable of appreciating the consequences of their actions—for that might be said of most of the feeble-minded—it is rather that their defect is accompanied by such a general instability of mind that they are either peculiarly susceptible to any suggestion, or are liable to flare up for the most trivial cause. The train is already laid; it is only the spark that is needed. It is obvious that feeble-minded persons of this type are much more likely to come into contact with the authorities than are the harmless, placid individuals previously described; and, as a matter of fact, a very large number of them are inmates of our workhouses, prisons, asylums, or charitable homes. Still, the number at large throughout the country is not inconsiderable, as is shown by the investigations of the Royal Commission.

To this account of the chief characteristics of high-grade amentia

we may add that, although deficiency of some kind or other is always present in the highest mental faculties, the nature of this is subject to considerable variation. In many persons there is an utter inability to acquire any kind of book-learning, although they may use their hands with considerable dexterity. On the other hand, there are those who possess a remarkable aptitude for acquiring certain forms of knowledge, but who are so simple and childish as to be utterly incapable of providing for their daily wants. Others, again, as will be seen in treating of moral defectives, have a degree of cunning and intellectual quickness of a certain order which is at times astonishing; whilst yet others are stolid, indifferent, and entirely negative. It is thus seen that mental defect cannot be looked upon as simply a lower grade of the normal, but as a distinctly pathological condition in which defective is accompanied by *irregular* development. Considered from the standpoint of practical daily life, the essential characteristic of this class is that, whereas the ordinary person, whether quick or dull witted, profits by his experience, and learns bit by bit to take care of himself and to adapt his behaviour to the exigencies of the moment, the feeble-minded person does not. The defective and irregular development of his mind have combined to bring about a lack of that quality which is so hard to define, and yet so essential to success in life—common sense. In any doubtful case, therefore, the diagnosis must rest not only upon the examination as to the present mental attainments, but also upon a careful consideration of the previous history and general conduct of the individual, as will be more fully dealt with in a later chapter.

CHAPTER X

IMBECILITY

Definition.—The term "imbecility" (Latin *imbecillus*, doubtfully derived from prefix *im* or *in*, and *bacillus*, a staff—one without a stay or support, hence feeble, helpless) is applied to the medium grade of amentia; and although there are many members at the top and bottom of this grade whose condition closely approximates to the feeble-minded and the idiots respectively, nevertheless it is one which, as a whole, has tolerably well-defined features. The imbeciles stand above the idiots in the possession of an instinct and partial capacity for self-preservation, but below the feeble-minded in their inability to perform sufficient work to contribute appreciably towards their support. The definition suggested by the Royal College of Physicians and adopted in a former edition of this book was: "Those persons who, by reason of mental defect existing from birth or from an early age, are incapable of earning their own living, but are capable of guarding themselves against common physical dangers." The recognized legal definition now, however, as given in the Mental Deficiency Act of 1913, is: "*Persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves or their affairs, or, in the case of children, of being taught to do so.*"

I must confess that I do not think this is an improvement upon the previous definition, and it seems to me to be just as applicable to the feeble-minded as to the imbecile grade of amentia. However, it is the one now recognized by the Law of England, and which must therefore be used in classifying for legal purposes. But for scientific and descriptive purposes the former is preferable.

Number.—The inquiries of the Royal Commission of 1904 showed that the total number of imbeciles existing in England and Wales

on January 1, 1906, was approximately 25,096 persons, corresponding to 0·73 per 1,000 of the population. The class is thus nearly half as numerous as the adult feeble-minded, and about three times as numerous as the idiots. The same inquiries show that imbeciles, both absolutely and relatively, are more prevalent in rural than in urban and industrial areas.

Sex.—There is a slight preponderance of the male sex, and out of 1,807 imbeciles discovered by the Royal Commission 959 were males and 848 females

Description.

All imbeciles come within the terms of the first definition just given, in that they possess the instinct of self-preservation as well as sufficient appreciation of their surroundings to avoid the common physical dangers which threaten existence. For instance, an imbecile realizes that the fire will burn him, that he may be drowned if he falls into the river, or killed if he drops from a height, or in front of a railway train, and he has sufficient sense to get out of the way of an approaching motor-car. In all these things he is superior to the idiot. On the other hand, he is lacking in the ability to perform such work as will contribute appreciably towards his support, although he may carry a letter or parcel and do simple jobs under supervision. He is as a rule incapable of reading, although he may be amused with pictures; he knows practically nothing of arithmetic, and is usually unable to carry on a rational conversation. In all these respects he is inferior to the feeble-minded. But whilst they all agree in these common characteristics, a certain proportion present such marked physiognomical, and often mental, peculiarities as to form distinct clinical varieties. These varieties will be described in subsequent chapters, the general account which will here be given of imbeciles and idiots, as also the preceding account of the feeble-minded, referring to the *simple* type (the "genetous" group of Ireland), to which the great majority of these persons belong. (See Chapter V., Classification.)

Physical Condition.—In a small number of persons suffering from imbecility of the secondary form (in which the defect is accidental and symptomatic of some acquired disease of the brain), the features, stature, and general bodily development may not differ from those of a healthy person. But these cases are not numerous, and in the great majority of simple imbeciles of the

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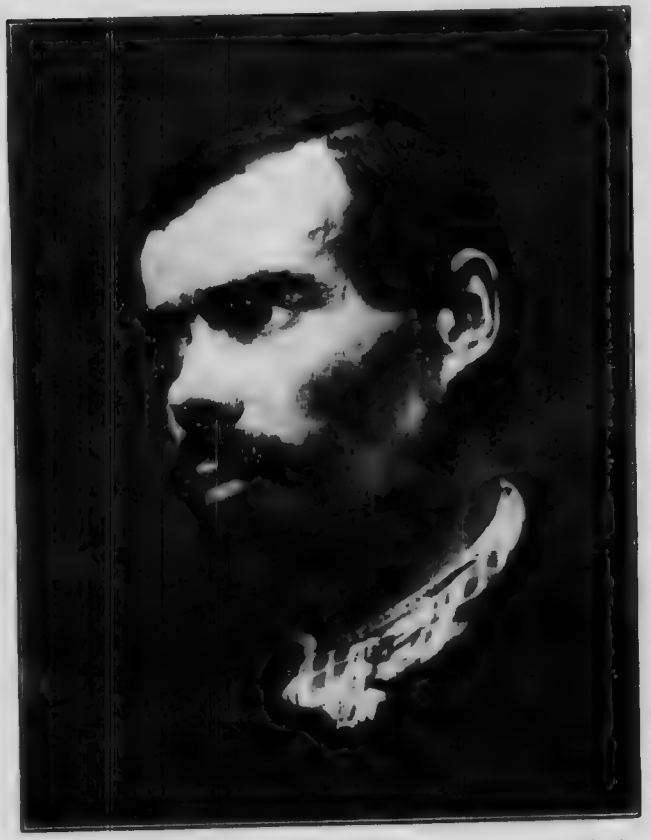

FIG. 21. A mentally unstable imbecile suffering from melancholia.

FIG. 22. A mischievous, excitable imbecile; usually grimacing as shown

primary form the bodily as well as the mental condition is obviously defective.

Occasionally gigantism is seen, but as a rule the stature is several inches less than that of the normal person. In addition, the body is ill-formed, its balance and carriage are ungainly, there are many oddities of walk and bearing, whilst stigmata of degeneracy are both numerous and prominent. The expression of the imbecile is usually in itself sufficiently striking to attract attention, varying from a stolid vacuity to a fatuous and childish smile or a look of sly cunning. Disturbances of physiological function are common. Various degrees of paralysis occur in a certain proportion of cases, and probably about 40 per cent. of all imbeciles suffer from epilepsy. On the whole, the bodily condition is so distinctive that even the casual observer has little difficulty in dubbing one of this class a "daftie" or "natural." (See Plates VI., VII., and VIII.)

Mental and Nervous Condition.—In some imbeciles one or more senses are markedly defective; in others there is an increased, and even extraordinary, delicacy of a particular sense; in the majority, however, sensory perception is merely obtuse, and a condition similar to, but decidedly more aggravated than, that in the feeble-minded is present. The tenacity of memory for isolated events does not appear to be diminished, but the range of memory is decidedly inferior to that of the normal person. Probably this is largely the result of a defective power of association. Spontaneous attention is sometimes diminished, and although many of these persons can be habituated to perform routine work of a simple kind, they are quite incapable of any task necessitating a sustained effort of voluntary attention. A few of the milder types show some evidence of imagination, but the majority are lacking in this faculty. Where the feeble-minded person will invent plausible excuses to escape punishment for his misdeeds, the imbecile will simply lie without embroidery. Many have some capacity for imitation, and at times this may be educated sufficiently to enable them to perform a certain amount of useful work; but they readily tire, and in most cases the value of the work done is not worth the supervision it entails. Occasionally the imbecile is markedly defective in volition, but this is by no means always the case, for some of these persons have exceedingly strong desires, and are capable of no little strength and cunning to obtain their ends. It is often easier to lead than to drive an imbecile, and some of them

are particularly amenable to suggestion. It is, however, in reasoning capacity that the most marked difference is seen between this class and the feeble-minded. The latter person, although very defective, is still capable of simple mental comparisons, and of arriving at simple judgments; but the imbecile is usually quite incapable of this.

Abnormalities of movement are of very common occurrence. In the apathetic type there is a general diminution, whilst in those of the excitable form all movement tends to be excessive. These excitable imbeciles are constantly chattering, running about, and generally interfering with everybody and everything. Some of them are violently aggressive, and a few become actually insane. Defects of co-ordination are both commoner and more pronounced than in the feeble-minded. Most imbeciles can speak, although they can only form simple sentences, and their vocabulary is a meagre one. The development of the faculty of speech is invariably late. A few are exceedingly voluble in conversation, but the matter is childish and inconsequent. Defects of pronunciation are numerous. Some imbeciles can read simple sentences, and a few learn to add and subtract upon their fingers, or by means of beads, but the scholastic acquirements of the class as a whole are of a very low order.

Like the feeble-minded, imbeciles are divisible into two chief types—the apathetic or stable and the excitable or unstable. Accordingly, they differ greatly in their disposition and general behaviour. Some are harmless, inoffensive, and well-behaved; but others are just the reverse, and require to be under constant observation. These latter are often sly and cunning to a degree, always in trouble, and possessed of pronounced immoral and anti-social tendencies. Some are clean in habits, modest, and possess a tolerable sense of decency; others are absolutely destitute of any idea of shame or modesty. Masturbation is very frequent in imbeciles of both sexes, and many of them will practise it in the most open and outrageous manner. Some imbeciles show unmistakable signs of jealousy, and a considerable number are exceedingly vain, not only of their dress and general appearance, but even of their mental attainments.

The following cases illustrate the chief features of simple imbecility:

C. H., a fat, smiling man, forty years of age, who has been in the

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FIG. 23.—A pronounced imbecile; quiet and well-behaved, but idle and untidy.

FIG. 24.—A mischievous, restless, and destructive imbecile of semi-Mongolian type; usually grimacing as shown.

asylum since boyhood. He has no friends living, and, beyond a note in the case-book to the effect that there is insanity on the father's side, there are no particulars. He understands and can carry on a simple conversation, but he cannot read or write, and has no conception of figures. He can, however, appreciate pictures, and will laugh immoderately at anything funny. He is good-tempered and obedient, but a perfect glutton, and will devour any scraps he comes across. He is too defective to be entrusted with any work without supervision, but is very willing, and spends most of his time with the gardener in the grounds.

J. F., male, twenty years old, is the last born of a family of seven, of whom three died in early childhood (one of convulsions); two are said by the mother to be "all right," whilst another is mental defective. The father is alive, but has been insane in an asylum twice; one of his brothers died in an asylum. The mother is alive, but in delicate health. Two of her sisters and one brother died of consumption.

James has always been "delicate"; he did not stand until turned two years, and did not walk until his fourth year. He was over five before he spoke, and even now his vocabulary is limited to about a dozen words. These he uses very sparingly, and it is rarely that he can be got to reply to questions, although he understands a good deal of what is said to him. He never attended school, as the headmistress refused to have him. He remained at home quite unoccupied until fifteen years of age, when he became unruly and more than his mother could manage. Since then he has been in the asylum.

He is a short, stumpy, fat youth, with coarse features, large outstanding ears, and a typical imbecile expression. He has a high saddle-shaped palate and very irregular and malformed teeth; but these cannot always be demonstrated, as he usually obstinately refuses to open his mouth. Cranial circumference, 22½ inches. There is no paresis, but he is clumsy and heavy in all his movements. There is no marked defect of the special senses, but, owing to his usually taking not the slightest notice of any question addressed to him, he has been thought to be deaf. This, however, is not the case, as I have succeeded in getting him to turn round at the sound of a whistle, and have once or twice managed to get him to execute a simple command. He seems to have little idea or care as to where he is, is apparently unconscious of the flight of time, and is,

as a rule, perfectly stolid and inoffensive. But occasionally he has a noisy outbreak, and then he will rush about the ward grunting, yelling and interfering with anyone whom he meets. I saw him one day munching biscuits out of a paper bag which had been brought him by his mother. I intercepted each biscuit on its way from the bag to his mouth. He did not seem to mind, and placidly got another out of the bag. When I had succeeded in getting them all, he stood still in a vacant, perplexed sort of way, without seeming to understand or care very much, and after a time he walked away.

H. C., female, seventeen years; is the fourth of a family of eight, three of whom died in infancy; insanity and epilepsy on father's side. No others are mentally affected, but mother says they are all delicate. The patient never seemed the same as the other children from birth, and did not walk until her fourth year. She has never talked properly. She went to school for several years, but never learned anything, and finally the mistress said she had better not come any more, so she has since been at home. She understands a good deal of what is said to her, and can execute simple commands, such as to shut the door or fetch a chair. She can answer simple questions in monosyllables, but her articulation is so defective as to be unintelligible to a stranger. She has no idea of number, and everything is "two." She has no knowledge of letters, but can make strokes and ciphers on a slate. She also knows the names of the common objects of the house. On the whole, she is quiet, obedient, and good-tempered. She is not actively destructive, but will always pick a patch off her clothes if they have been mended, and her chief joy is to have a piece of cloth given her to fray out. She cannot wash or dress herself, but can feed with a spoon, and is of clean habits. Her chief peculiarity seems to be that, as soon as she takes the first mouthful of food, she invariably goes to sleep, and has to be wakened to finish her meal.

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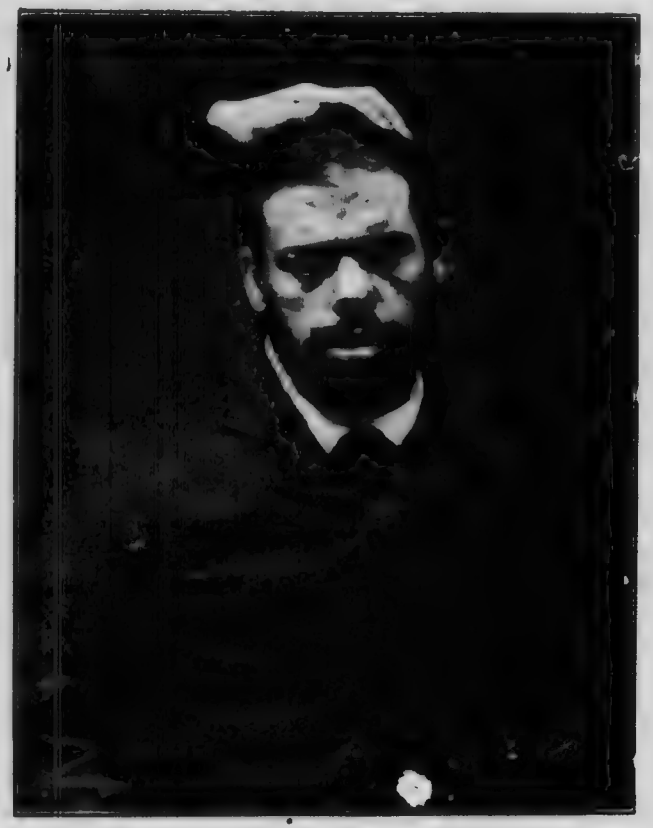

FIG. 25.—A pronounced imbecile. Idle, destructive, and at times aggressive; subject to frequent epileptic fits.

FIG. 26.—An imbecile of the stolid, apathetic type; does a little work under supervision.

PLATE VIII.

CHAPTER XI

IDIOCY

Definition.—In the idiots we see the third and lowest degree of defect, and the mental deprivation in these persons is indeed such as to fully justify the term *idios* (a person "private," "apart," or "solitary") which is applied to them.

The line between this class and the imbeciles has been variously drawn by different writers. Some would consider the presence or absence of speech as the criterion, but there are many imbeciles—and even feeble-minded—who cannot speak. Others, again, would use attention or volition, but these are not necessarily lacking in the idiot. If a line is to be drawn, and, if only for purposes of description, it is clearly a great advantage that we should have some means of differentiation, then I think that the absence of the instinct or power of self-preservation constitutes the most convenient one, and this we shall accordingly use.

The idiot is therefore defined as "*a person so deeply defective in mind from birth, or from an early age, as to be unable to guard himself against common physical dangers.*" This, it may be added, is now the legal definition as given in the Mental Deficiency Act of 1913.

Accepting this as the criterion, it is at once seen that idiots are divisible into two groups. In one of these the defect is so profound as to involve the fundamental organic instincts, and even that of sucking is absent. There are termed *complete, absolute,* or *profound idiots.* In the second group the primitive instincts are present—there is even some glimmering of mind—but there is not sufficient intelligence to understand and avoid the common physical dangers which threaten existence. These may be termed the *partial* or *incomplete idiots.*

Number.—The number of idiots existing in England and Wales

on January 1, 1906, was, approximately, 8,654 persons, corresponding to 0·25 per thousand of the entire population. The class is thus about one-third as numerous as the imbeciles, and comprises about 6 per cent. of all aments. As we have already seen, idiots are absolutely and relatively much more numerous in rural than in urban districts, and, taking areas with a similar incidence of total amentia, we find that there are often from four to five times as many idiots present in the former as in the latter situation. A similar variation of incidence with regard to environment has been shown to obtain with the imbeciles also, but the disproportion is much greater in the case of the idiots.

With regard to **sex,** the inquiries of the Royal Commission show that, of 585 idiots existing in the 16 areas of the United Kingdom which were investigated, there were 303 males, and 282 females.

Description.

Partial or Incomplete Idiocy—*Physical Condition.*—The various anatomical and physiological anomalies present in the imbeciles, and to a somewhat less extent in the feeble-minded, reach their maximum in the idiots; and the members of this degree consequently present an appearance which is in itself distinctive. Some of them are grotesque, but the majority are such stunted, misshapen, hideous, and bestial specimens of morbid mankind that they arouse feelings of horror and repulsion rather than of levity. (See Plates IX. and X.) Paresis or paralysis is very often present, and this tends still further to aggravate their defective physical condition. In some cases this paralysis is due to a non-development of the tracts of the cord; but in the majority it is the result of disease or severe gross lesions of the brain or nervous system superadded to the original developmental defect, such as porencephaly, hydrocephaly, microgyria, localized atrophies, and anomalies of the internal ganglia. The paralysis may be slight or severe. It may involve a hand or foot, or be a complete hemiplegia or diplegia. Many of these creatures are in consequence chair- or bed-ridden. Occasionally the condition known as " scissor-legs " is seen, in which there is paralysis of both lower limbs, with dislocation of the hip-joints, so that the legs are permanently crossed like a pair of scissors. There was a very perfect example of this at Darenth Asylum a few years ago. The feature of most of these paralyses is that they are the result of

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PRIMARY AMENTIA (IMBECILITY).

FIG. 27.—A pronounced imbecile with right hemiplegia.

PRIMARY AMENTIA (IDIOCY).

FIG. 28.—A case of partial idiocy, accompanied by sclerosis.

PLATE IX.

lesions occurring before or shortly after birth; consequently the limb involved is stunted in its growth and development.

Epilepsy is very frequent in simple idiots, and occurs in about 56 per cent. of cases; various forms of tremor and athetosis are also frequently seen.

Many idiots are extraordinarily voracious, and gulp down their food with such haste as to be in imminent danger of choking. It has more than once happened, where spoon diet has not been given, that tracheotomy has had to be performed for the removal of a lump of food from the larynx. In a few cases rumination is seen. Troublesome diarrhœa is a very common result of the gluttony of these persons. Ireland mentions two cases in which inordinate thirst was present, the patients drinking almost any kind of liquid in enormous quantities; neither was diabetic.

Most idiots are sterile, but this is not always the case, and in some sexual feelings are obtrusively evident. As a class they are unusually prone to disease and to early death, particularly from tuberculosis.

Mental and Nervous Condition.—Defects of sensation are very common in idiots, and although morbid conditions of the end-organs of special sense are very frequent, nevertheless the lack of perception seems to be more often due to a central than to a peripheral defect. All the senses may be affected, but it usually happens that one is most so. We thus find some idiots particularly impervious to sounds, others to sights, tastes, or odours.

It is difficult to test the memory of these persons, but on the whole I am inclined to think that it is usually in default. Imagination seems to be wanting altogether, but some of the milder types have a certain capacity for imitating the actions of those around them. Active attention is very deficient, but spontaneous attention is by no means always absent. Such thoughts as exist must be of the simplest description, and limited to objects immediately present to their senses. They have no power of reasoning, and although a few can connect simple words with the objects to which they relate, the majority cannot do this. Idiots have to be washed, dressed, and fed like little children; many of them are utterly inattentive to the calls of nature, but some can be taught habits of regularity and cleanliness in this respect. They are by no means lacking in energy and volition, and many of them apparently experience satisfaction in destroying anything they can get hold of;

but their energy cannot be directed into any useful channel, nor are they even capable of intelligent play.

Tears are very rarely seen, but there is no doubt that some of milder degree are capable of the simpler emotions. They evince anger, passion, and fright, and some of them will run away with a look of alarm upon the entrance of a stranger. They seem to be absolutely lacking in any sense of right or wrong, and these ideas cannot be implanted in them.

Speech is usually absent, although a few learn to articulate such simple monosyllables as *man*, *cat*, *eat*, etc., but none of them can form sentences. Their utterances mostly consist of inarticulate grunts, screeches, and discordant yells; but there can be no doubt that these often express their feelings, just as do the cries of animals, and an observant physician or attendant is able by this means to discern whether they are satisfied or dissatisfied, contented or annoyed, sometimes even to interpret their simple wants. It is noteworthy that, although quite unable to articulate, some idiots will hum a tune which they have heard, with tolerable accuracy.

Movement is often abnormal in quantity and quality. In the apathetic type of idiots it is deficient, in the excitable excessive. In both these forms co-ordination is usually very imperfect, and they are hardly ever capable of any delicacy of manipulation. In standing, walking, or running the same defect of co-ordination is seen.

Apathetic and Excitable Idiots. — We have seen that the less-pronounced grades of defect are divisible into two classes according as they are of stable or unstable mental equilibrium; the same is true of the idiots, some of these being apathetic, and others excitable. The former are mild, placid, inoffensive creatures who give little trouble, and who even evince a certain amount of affection for those who feed and attend to them. The excitable type, on the other hand, are passionate, violent, untrustworthy, and intractable. Many of them are so exceedingly destructive that nothing is safe within their reach. They will destroy clothes, toys, picture-books, even furniture, and if left alone for a few hours, the probability is that they will either wreck the room or set fire to or seriously injure themselves in some way. I have seen several of this class in cottages where the only available means of curtailing their activities within a reasonable sphere of influence was to tether them to the table leg.

[Photographic Soc. 1891.

FIG. 29.—Partial idiocy of the excitable type.

FIG. 30. Partial idiocy of the excitable type.

Often they are exceedingly cruel to animals, and seem to experience pleasure at the cries of their unfortunate victims.

Those of this type who are chair-ridden still manage to find an outlet for their excitability in the almost ceaseless performance of automatic actions. Thus, some will spend the day turning the head from side to side or nodding up and down; others rock the body to and fro, or beat upon the chest with the hand, often keeping time to the movement with a monotonous, inarticulate chant; others unceasingly suck their fingers. These movements do not occur during sleep, and they are terminated by the advent of feeding-time or the entry of a stranger, although at times a visitor seems to stimulate them into still more violent activity. It is evident that they are attended with satisfaction, for the patients commonly resent forcible interruption, and resume the movements again the moment they are free. In a proportion of cases this condition of restless activity is not constant, but intermittent, and resembles the periodical outbreaks of maniacal excitement which occur in the milder aments. Such persons will rush about the room or dormitory uttering hideous screeches and yells. In moments of passion they will even hurl themselves violently against walls or floor, and in so doing often sustain serious injuries. But the process seems to be rather pleasurable than painful. Even in those of the apathetic type, the advent of puberty often ushers in a marked alteration of character and behaviour, and there are many idiots who, having been fairly manageable and inoffensive until this time, then become so destructive and unreliable that the restraint of an institution has to be sought.

The following are illustrative cases:

E. J., female, aged thirty-two years. A pronounced history of insanity and epilepsy on the maternal, and alcoholism on the paternal, side. Has been in the asylum since seven years of age. A repulsive-looking woman with a muddy, freckled face, coarse red hair, and numerous stigmata; cranial circumference, 21 inches. She can walk, but spends the day sitting in a chair turning her head from side to side, rocking herself to and fro, and biting her hands. She is of unclean habits and is unable to do anything for herself. She is quite deaf in the right ear, but listens attentively to the ticking of a watch held close to her left one. She seems to have no knowledge of time or place, and apparently no understanding of anything said to her. But when the piano is played, she at once

ceases her rhythmic movements and listens attentively. She cannot speak, but she will hum the tunes she has heard so well that they are readily recognized. As a rule she is harmless, but upon any attempt at examination she makes violent resistance and tries to bite, and she is at times spiteful and interferes with the other patients.

A. D. P., female. Has been in the institution since childhood, but the family history is not obtainable, as there are no friends living. On admission she was unable to dress or feed herself, and had no apparent understanding of anything said to her. She showed no curiosity, no imitativeness, and no power of attention. Her habits were unclean, and she was constantly dribbling from her mouth. She was a voracious eater. She was unable to speak, but addicted to violent yells, often interspersed with a peculiar sound like the braying of a donkey. She was at times exceedingly violent, kicking, biting, and scratching the nurses and other patients indiscriminately, and, in fact, was generally a source of endless trouble to the whole ward. She remained in practically the same condition until thirty-five years of age, when she had an epileptic attack From this time until her death she was subject to occasional recurrences of the fits, and she died at the age of thirty-six, of gangrene of the lung, resulting from the aspiration of a small portion of food. The cranial circumference was 20 inches, and there were numerous stigmata of degeneracy.

On making a post-mortem examination, I found a very thick, dense skull with an absence of diploë. The brain was small, weighing 1,022 grammes, but, beyond being very simply convoluted, there were no naked-eye anomalies. Microscopical examination, however, revealed extensive imperfections of the cells of both brain and spinal cord like those already described.

Absolute, Complete, or Profound Idiocy. — In this condition we see humanity reduced to its lowest possible expression. Although these unfortunate creatures are, indeed, the veritable offspring of *Homo sapiens*, the depth of their degeneration is such that existence —for it can hardly be called life—is on a lower plane than even the beasts of the field, and in many respects may almost be described as vegetative. They come into the world without even the hereditary instinct of sucking. As they grow up they have to be fed, and would die of inanition amid abundance of food were it not put into

their mouths. If they are conscious of excessive heat or cold, they are devoid of any idea of the remedy. They respire, assimilate, and excrete, but they have no sexual instinct, and cannot reproduce their degenerate species. They may be capable of inarticulate cries, but they cannot speak. They possess the power of muscular movement, but locomotion is absent. They have eyes, but they see not; ears, but they hear not; they have no intelligence and no consciousness of pleasure or pain; in fact, their mental state is one entire negation. The short existence of most of these creatures is spent in bed, where they lie huddled up in an ante-natal posture. They are hideous, repulsive creatures whom Nature permits to enter, but not to linger, in the world, and in their life and death are revealed the culminating and final manifestation of the neuropathic diathesis.

CHAPTER XII

THE CLINICAL VARIETIES OF PRIMARY AMENTIA

It is probable that nearly 90 per cent. of all aments belong to the primary group, and the majority of these, as already mentioned, present no special distinguishing features beyond the anatomical, physiological, and psychological anomalies common to primary aments in general. These, which may be termed the *simple* variety, have been described in the preceding pages.

A small proportion, however, present such special characteristics as to form distinct clinical types. The chief of these are the *Microcephalics* and *Mongolians*, and these will be described in the present chapter. We shall also briefly refer to some clinical subvarieties which are the result of superadded morbid complications.

The Grecian, American-Indian, Negroid, and other ethnic types which have been described by some authors do not seem to me to possess sufficiently distinguishing features to merit special notice.

MICROCEPHALIC AMENTIA.

By the term "microcephalic ament" is usually meant a person whose skull is less than 17 inches in its greatest circumference. But in view of the fact that other persons, with a greater cranial measurement than this, present similar mental peculiarities as well as skull configuration, I am disposed to think that the criterion should be one of shape rather than size. Most members of this variety belong to the more pronounced degrees of amentia, and, if the test of measurement be the one adopted, they probably do not comprise more than about 5 or 6 per cent. of all aments. If, however, the milder cases be included, and the criterion be that of cranial shape, this number is considerably increased, and probably reaches 10 or 12 per cent. Many of these latter are merely feeble-minded.

Causation.—The condition is one which has attracted much

attention, particularly from anatomists, and two views have been put forward as to its causation. The first of these is that it is an atavistic variation; the second, that it is a pathological condition due to premature closure of the cranial sutures.

One of the earliest advocates of the atavistic theory was Charles Vogt, of Geneva, who, in a paper published in 1867,* attempted to show that microcephaly was a reversion to a prehuman type. Many cases were examined, and most minute dissections made by accomplished anatomists on the Continent and in this country. Conclusive evidence was adduced in support of the view, and equally conclusive facts in denial of it. It was at a time when the evolutionary theory was attracting widespread attention, and it was not to be wondered at that the curious appearance of microcephalics should cause them to be looked upon as instances of a reversion to a simian type. It is unnecessary to enter into the pros and cons of the argument; it is sufficient to state that the fact has now been established, as a result of many examinations, that microcephaly is not an atavistic variation, but a pathological condition, and that these persons, although degenerate, are still human.

The second theory, that microcephaly was due to a premature synostosis of the cranium, attracted hardly less interest. Baillarger† seems to have been the author of this view, and he enunciated it on the strength of some apparently very definite statements by the mothers of microcephalic children, that at birth the anterior fontanelle was closed. These statements were corroborated by Baillarger's examination of some cases in which synostosis was present. But it has since been found that many microcephalics exist in whom the sutures are not closed; in fact, such is the exception rather than the rule, and hence this theory is now discarded. In the instances in which bony union has taken place, it is much more likely to be the effect than the cause of the arrested cerebral development.

The real truth is that microcephaly is neither atavistic nor accidental, but the result of inherited blight, just as is amentia in general. In most of the cases which I have examined morbid inheritance was present; in fact, microcephalics usually come of a

* C. Vogt, Geneva, "Mémoires sur les Microcéphales ou Hommes Singes," 1867. On this subject see also "I Cervelli dei Microcefali," Professor Giacomini, Turin, 1890; also an excellent chapter in Dr. Ireland's work.

† Baillarger, *Gazette Médicale de Paris*, 1857, p. 482; also Cruveilhier, "Anatomie Pathologique Générale," Paris, 1876.

pronounced neuropathic stock, their brothers and sisters are often typical degenerates, and frequently one or more of them suffer from the same condition. Houzé* has described a family in which two children, their father and grandfather, were all microcephalics. They are simply the result of a more gross developmental arrest than that which obtains in the majority of aments. There seems to be little doubt that many of the dwarfs exhibited in public have been microcephalics; on the other hand, such dwarfs as Joseph Boruwlaski, Zimmermann, Jeffrey Hudson, and Tom Thumb have shown marked intelligence in spite of their small cranial capacity. The explanation of this is doubtless, as mentioned by Dr. Hastings Gilford,†that these latter are examples of ateleiosis in which the correlation between size of brain and of body remains normal. But it is important to bear in mind that microcephalic amentia is due to no mere disparity in the relative size of the brain, but to qualitative changes in the brain cells in addition.

Pathology.—The characteristic of this condition is a hypoplasia of the cerebral hemispheres, which is more particularly pronounced in the temporo-sphenoidal, parietal, and occipital regions, so that the posterior lobes of the cerebrum rarely suffice to cover the cerebellum. To this the peculiar "sugar-loaf" conformation of the skull is due. In most cases, although under-developed, the primary sulci may be traced; but in some instances these are very imperfect; in the majority of cases there is also a marked deficiency in the secondary gyri, so that the complexly convoluted aspect of the normal brain is entirely wanting. In addition, there is often localized agenesis of particular areas, resulting in the condition described as "microgyria," as well as gross developmental anomalies of the corpus callosum and internal ganglia. Not a few cases are complicated by some recent morbid process, of which the commonest are porencephaly, encephalitis, and hydrocephalus. The cerebellum is smaller than the normal, but is not affected to anything like the same extent as the cerebrum. The hypoplasia nearly always involves the spinal cord, which is much thinner and shorter than normal. The parts most affected are the pyramidal tracts and columns of Goll, the anterior columns and direct cerebellar tract somewhat less so. Disseminated sclerosis and pseudo-hypertrophic

* Houzé, "A Case of Hereditary Microcephalus," *Bull. de la Soc. d'Anthrop. de Bruxelles*, tome xxi.

† Hastings Gilford, "Disorders of Post-Natal Growth and Development," 1911.

paralysis have also been noticed in microcephalics (Langdon Down). From the stage of development of the cerebral fissures, it is quite evident that the cause is one which has been at work before birth. Microscopical examination of these cases usually reveals a similar condition of irregular and imperfect development of the cells of the brain cortex to that already described. The anterior horn cells of the spinal cord also frequently show similar changes.

The weight of the brain varies very much in these cases. The lightest on record is the one described by Dr. Sander, as mentioned by Ireland, which only weighed 170 grammes (about 6 ounces). A case described by Dr. Fletcher Beach weighed 198·4 grammes, whilst the brain of the celebrated Helene Becker weighed 219 grammes. But these are somewhat exceptional examples, and typical microcephaly may be present with a brain weighing several hundred grammes more than these. The normal weight, it may be remembered, varies from about 1,100 to 1,400 grammes in the male (mean average, 1,374 grammes or about 48 ounces), and 1,000 to 1,300 grammes in the female (mean average, 1,244 grammes or about 43 ounces).

In view of the extreme smallness of the brain in these persons, the question naturally arises as to the influence of size of brain upon intelligence. There is, no doubt, a brain weight and cranial circumference so small as to be incompatible with anything more than a state of idiocy, and Félix Voisin places this at 13 inches circumference. Excluding dwarfs, it is tolerably certain that with a cranial circumference of 17 inches the mental capacity will not range above that of imbecility, and it is probable that the adult whose cranial circumference is more than 2 inches less than the normal minimum will be feeble-minded. But beyond this we cannot go, and even these statements can only be considered as of general application, for the size of the brain must be considered in relation to the size of the body.

The average size of the skull in aments is decidedly less than the mean average of normal persons, although there are a few (excluding hydrocephalics) in which the normal measurements are exceeded. But even in aments, apart from extreme cases like those of microcephaly, there is no constant relationship between the amount of intelligence and the cranial capacity.

The same is true of normal persons. The range of variation in the mentally sound is as much as 700 to 800 grammes (about 26 ounces),

and there have been even eminent men who have diverged from the normal to a greater extent than this. For instance, the heaviest healthy brain on record is that of Turgenieff, the Russian novelist, which weighed 71 ounces, whilst that of Gambetta weighed but 40·9 ounces. The head of Shelley was also very small. The brain of Napoleon was 53 ounces, that of Cuvier 58·3 ounces, whilst the brains of Abercrombie and Daniel Webster each weighed over 63 ounces. But a whole race, the ancient Peruvians, attained to a very considerable degree of social development and excellence in the arts with a mean average brain capacity of only 40·1 ounces. Dr. Wilder* has recently described a remarkably light brain in a man who died at the age of forty-six years. He was 5 feet 6 inches in height, and weighed 145 pounds, and at the time of his death was employed as a watchman. He could read and write, was always regarded as being in the full possession of his faculties, and had worked as a labourer in one situation for twenty years. From all reports, there was nothing defective or peculiar about him, either mentally or physically. Upon making a post-mortem examination, no measurements of the skull were taken, but it did not appear unusual in size or shape. The brain filled the cranium, there being no excess of liquid or evidence of compression, but its weight in the fresh state was only 24 ounces (680 grammes). The cerebellum seemed nearly normal in size and form, whilst the cerebrum was only about half the usual weight, and peculiar in several respects. As against this may be mentioned a brain described by Dr. G. A. Watson† which is probably the heaviest on record. The patient was an epileptic, who died in Rainhill Asylum; but before the epilepsy appeared he was of quite average intelligence, with considerable musical ability. The weight of the brain was 2,130 grammes (75 ounces); it was of good general shape, and remarkably complex in its convolutions. The large size could not be accounted for by any pathological appearances, since a thorough microscopical examination showed a normally developed cortex, the only degenerative changes present being those commonly seen in cases of long-standing epilepsy.

The fact is that intellect is dependent upon quality as well as quantity of brain, and although in many aments a quantitative defect is present, there is always a qualitative deficiency also.

* B. G. Wilder, *Journal of Nervous and Mental Disease*, February, 1911.

† G. A. Watson, Report of Lunacy Commissioners, 1913.

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FIG. 31.—Microcephalic imbecile, also subject to epilepsy. Head circumference, 18½ inches.

FIG. 32.—Microcephalic imbecile; a tolerably good worker in the wards. Head circumference, 17 inches.

Accordingly it results that even in microcephalics there is no constant relation between size of brain and mental capacity.

Description—*Physical Condition.*—The two chief clinical distinguishing features of this variety of amentia are the peculiar configuration of the skull and the (usually) very small stature. As a result of the cerebral hypoplasia there is a marked deficiency in the frontal and occipital regions of the cranium, which in consequence shelves away in a curiously "sugar-loaf" or cone-like manner. This shape, by some termed *oxycephalic*, is always present in microcephaly, and when in conjunction with the receding chin, gives a very characteristic and bird-like appearance to these creatures. (See Plates II., III., and XIX.) In consequence of the diminished surface of brain to be covered, the scalp is nearly always extraordinarily thick and redundant. In some cases it is permanently thrown into a series of deep furrows running antero-posteriorly, a condition which was first described in this country by Dr. T. W. McDowall,* and which seems to be confined to microcephales.† In addition the hair is usually extraordinarily coarse and wiry, and on more than one occasion I have known the teeth of the clipper to be broken whilst the hair was being cut.

As already remarked, the cranial circumference in these cases varies very much, and the diagnostic feature is one of shape rather than of size. There have been several cases recorded in which the greatest circumference was 15 inches or under; on the other hand, I know several typical microcephalics with a cranial circumference of 19 inches and more, and one whose skull measures as much 21 inches. It is to be remembered that the actual brain capacity is less than a mere circumferential measurement would suggest by reason of the deficiency being chiefly in the upper parts of the skull.

The second characteristic, that of diminished stature, is not so constant; nevertheless, as a class, microcephalics are the smallest of the varieties of amentia, and many of them may be called dwarfs.

* T. W. McDowall, "Abnormal Development of the Scalp," *Journal of Mental Science*, January, 1893; also a further account by T. W. and C. McDowall, *Journal of Mental Science*, July, 1912.

† Dr. McDowall was good enough to place a portion of the scalp of one of these patients, who died under his care, at my disposal for examination. I found a considerable thickening of all layers, the average thickness down to the roots of the hair follicles being from 4 to 5 millimetres, and this after hardening in spirit.

Few of them grow to more than 5 feet, although "Joe" (described by Dr. Ireland) reached 5 feet 9 inches in his boots. But this is decidedly exceptional.

In other respects microcephalics present the anomalies common to aments in general, and which have already been described. They rarely live to an advanced age (in this respect also I think "Joe" is unique, since he was sixty years old at his death), and the majority die of tuberculosis.

Mental and Nervous Condition.—The intellectual capacity of these persons varies within very considerable limits, and we thus have microcephalic aments of each of the three degrees of deficiency. A considerable number are idiots, unable to do anything for themselves, unable to understand more than a few words, and incapable of speech. Others, and the majority, belong to the imbecile class, and are capable of understanding most of what is said to them, can say a few words, and can perform simple tasks. A few are merely feeble-minded. The case of "Joe" is probably the best example of the mildest degree of defect, for Dr. Ireland says that until after forty years of age he was apparently able to earn sufficient wages to maintain himself. I know several typical microcephalics amongst mentally defective children attending special schools who can read, write, do simple sums, and who probably possess sufficient intelligence to earn their living under supervision; and one woman of this type, with a cranial circumference just under 17 inches, is one of the most industrious inmates of a county asylum.

The mental features common to most microcephalics are the absence of any sensory defect, a general vivacity, restlessness and muscular activity, a considerable capacity for imitation, and, usually, an inability for sustained effort. In their perceptive faculties these persons often compare favourably with aments of considerably higher general intelligence, and many of them not only have remarkably good hearing and sight, but extremely quick powers of observation. The restlessness is sometimes expressed by the performance of peculiar actions which have caused them to be likened to various animals. Thus, Lombroso describes a "bird man," a "rabbit man," and a "goose man." Their power of mimicry is often very marked, and this, combined with their general alertness, causes them to be amongst the drollest inmates of the imbecile ward. There was a chattering, restless ament of this type at Darenth a few years ago, who was very pat in making remarks

upon anything coming under his observation, and who was a source of endless amusement to the attendants by his witticisms concerning one of them in particular. Another boy, aged eleven years, with a cranial circumference of 15¾ inches, was most adept in mimicking the various performers in the band.

In disposition the majority are affectionate and well-behaved. Many of them, before training, it is true, are apt to be quarrelsome and difficult to manage, but they usually soon lose these propensities and become quite amenable to the discipline of an institution.

The majority of microcephalics of the idiot degree suffer from a condition of general helplessness, which causes them to be unable to do anything for themselves, and many of the imbecile grade even experience considerable difficulty and unsteadiness in walking. This does not appear to be due to actual paralysis (although I have seen a few cases with typical spastic paralysis and increased tendon reflexes), but to an imperfect development of the tracts of the spinal cord. About half of them are subject to epileptic fits.

In conclusion we may briefly cite the chief instances of this interesting condition which have been recorded.*

Dr. Wilbur described (1857) an idiot aged twelve years, in the New York State Asylum, whose cranial circumference was only 13¾ inches. He was passionate, uncleanly in his habits, could distinguish a variety of forms and colours, knew the names of all objects in the schoolroom and about the house, and recognized a great number of pictures of objects. He made but little progress in speaking, and after being in the asylum five years, though improved in many respects, he was found incapable of further progress, and was dismissed.

Antonia Grandoni was described by Professor Filippo Cardona, of Milan (1870).† She was a typical microcephalic, with a cranial circumference of 15 inches; her height was 49⅛ inches; and she died at the age of forty-one years. She had no sensory deficiency; in fact, her hearing was very quick and her observation very keen. She understood what was said to her, and was able to converse. She had a good memory for persons and events, was of a sociable and decidedly amorous and erotic disposition, and much addicted to dancing. Although decidedly defective, she had sufficient intelligence to do simple domestic duties and to run errands; in fact, con-

* For these particulars I am largely indebted to Dr. Ireland's work.
† *D'Una Microcefala*, Milano, 1870.

sidering the extremely small size of her brain, her intelligence was altogether remarkable.

Helene Becker died of phthisis at the age of eight years, and a very careful and complete examination was made, and report published, by Dr. Bischoff of Munich (1873).* This girl was a low-grade idiot; she knew her own name, but was practically incapable of understanding anything beyond, although she knew when people were angry with her. Her speech was limited to one word. She was very restless, always moving her hands and arms and the upper part of her body. The brain weighed 219 grammes. Another child in the family was microcephalic.

The "*bird man*," a microcephalic with a cranial circumference of 15 inches, was described by Professor Cesare Lombroso (1873).† He was so named from a habit of chirping like a bird, hiding his head under his armpit, leaping on one leg, and stretching out his arms like wings. He was said to be wanting in touch, taste, and smell, was dirty in his habits, and given to coprophagy. Professor Lombroso also recorded two other microcephalics under the designation of the "rabbit man" and the "goose man," also the three brothers, *Nicolò*, *Serafino*, and *Giovanni Cerretti*. These were aged twenty-one years, thirteen years, and ten years, and had a skull circumference of 17¾, 16½, and 16¼ inches respectively.

The "*Aztecs*" were a pair of microcephalic aments, boy and girl, of American-Indian origin, who were exhibited all over Europe and America for forty years, and who have been described at various periods by different writers, including Professor Owen. They were seen by Dr. Dalton when aged seven and five years respectively, and were described as being only able to repeat a few isolated words, but very excitable, vivacious, in almost constant motion, and full of curiosity. Their habits as regards feeding and taking care of themselves were those of children two or three years old. They were publicly married in London in 1867, but had no offspring. They were alive in 1893, but I have been unable to find any record of them since that time.

Freddy, who was under the observation of Dr. Shuttleworth for twenty years at the Royal Albert Asylum, died at the age of twenty-nine years, of phthisis. At the time of his death his height was 4 feet 8 inches, the cranial circumference was 15 inches, and the

* *Anatomische Beschreibung eines mikrocephalen, 8 Jährigen Mädchens.*

† *Rivista Clinica di Bologna*, July and November, 1873.

weight of the fresh brain was 12½ ounces. The cranial circumference at eight years was 14⅛ inches, and at twelve years 14½ inches. Dr. Shuttleworth describes him as manifesting good powers of observation, but only able to express himself in a few monosyllabic words. He had considerable will-power, and though it was found impossible to train him to much that was useful, he was in no sense a low-grade idiot. A very complete examination of this case was made and recorded by Professor J. D. Cunningham and Dr. T. Telford-Smith (1895).*

Joe, who was examined by Dr. Ireland in the Lancaster Workhouse at the age of forty-five years, had a cranial circumference of 17 inches, and attained the unusual height of 5 feet 9 inches (in boots). Until eighteen months previously he had earned enough wages to keep himself, and he died at the age of sixty years, of phthisis. This case also was fully described by Cunningham and Telford-Smith.

In a district of the Punjab is a shrine to which are brought microcephalic imbeciles from all parts of the country to be placed under the care of Shah Daula, the incumbent saint. These creatures are named Shah Daula's "Rats," from their facial resemblance to this rodent, and they were first described by Ewens. There is a good deal of mystery attaching to their origin, but Ewens suspects that their numbers are kept up by practices which occur at the shrine. They have recently been further described by Couchoud.†

MONGOLIAN AMENTIA (MONGOLISM).

The *Mongolian*, *Kalmuc*, or *Tartar* variety of amentia was first so named by Dr. J. Langdon Down, from the facial resemblance of these persons, in certain particulars, to members of the Mongolian race. When well marked, their peculiar characteristics give rise to a physiognomy and clinical picture which is exceedingly distinctive and unmistakable, but it must be admitted that not a few aments are met with who present only some of the features of this class, and who are thus intermediate between the Mongolian and the simple variety of amentia. Such are often called "semi-Mongols."

* Transactions Royal Dublin Society, vol. v., Series 2, Part VIII. An excellent recent account of microcephaly is that by Dr. Giovanni Mingazzini (*Monatsschrift für Psychiat. und Neurologie*, Band vii., Heft 6, June, 1900). This gives most of the literature to date.

† P. L. Couchoud, *L'Encephale*, March 10, 1912.

The number of Mongols is not large. If only those with well-marked characteristics be included, they probably do not form more than about 4 or 5 per cent. of all aments. One often hears it said that they are on the increase, but I know of no data in support of this statement. In Germany, according to Vogt, they are much less frequent, and only occur to the extent of 1 per cent. of all aments. Many of the physical features of this class are noticeable at, or shortly after, birth, and this fact, together with their retardation of development, causes them to be not infrequently seen in the consulting-room and the outpatient department of hospitals devoted to children. They bear a superficial resemblance to, and are often confounded with, cretins; in fact, this type of amentia used formerly to be called "cretinoid" idiocy.

Causation.—The cause of this condition is still shrouded in obscurity, and although for the present it seems better placed amongst the varieties of primary amentia, it is in some respects so suggestive of some specific glandular or nutritional defect, that it is quite probable that it may eventually have to be removed to the secondary group. Dr. G. A. Sutherland,* in one of the best accounts we have of Mongolism as seen in the early years of life, remarks that these children "resemble each other so closely that they appear to be members of the same family," and he very truly argues from this that the cause is more likely to be particular than general, such as those concerned in the production of the majority of aments. "General causes," he says, "such as parental alcoholism, nervous disease, or insanity in the family, etc., are not likely to produce such an exact type of disease as exists in Mongolism. It seems probable that one and the same cause is at work in all cases." Sutherland found that, out of his total of twenty-five cases, syphilis was definitely present in eleven patients, and from the symptoms and history it was strongly suspected in three others. He therefore suggests that, whilst further investigation is required to ascertain the exact etiological factor, the condition may turn out to be a parasyphilitic one.

It is undoubtedly true that the curious assemblage of physical signs which are present in typical Mongolism does suggest a certain uniformity of causation in these cases. But it is necessary to remember that Mongolism consists in a particular *combination* of

* G. A. Sutherland, "Mongolian Imbecility in Infants," based on a study of twenty-five cases, *Practitioner*, December, 1899.

anomalies rather than in anomalies which are distinctive in themselves, and there are many ordinary aments who possess one or more of the features which go to make up the *tout ensemble* of the Mongol; in fact, I do not know of any single feature of these persons (with the possible exception of the tongue) which may not be seen in other aments. It is, therefore, the *combination* only which is distinctive. With regard to the question of syphilis, the evidence produced by Dr. Sutherland is undoubtedly very strong; but, as equally strong evidence to the contrary, it may be stated that, in over twenty cases of this variety in which I investigated the family history, I was unable to discover any preponderance of syphilis, and in some of the cases I have no hesitation in saying positively that syphilis was not to be thought of. It is also interesting to note that of eight cases subjected by Dr. Gordon* to the Wassermann reaction, not one gave a positive result. In nearly all my cases there was a neuropathic family history, and frequently a strong tubercular taint; but over and beyond this what I did frequently find (and what I think may possibly be the factor common to this type) was a history pointing to a condition of uterine exhaustion or ill-health of the mother during gestation. Many of the patients were the later born of a large family, often numbering as many as ten or twelve, and where this was not the case there was usually a state of severe physical prostration of the mother during the gestation period.† It is possible that many conditions, syphilis included, may bring this about, and I have on several occasions seen children produced by weakly mothers, at the end of the child-bearing period, who had quite a Mongolian type of physiognomy, but who were mentally normal. At the same time it is to be noted that the birth of a Mongol may be followed by that of other children who appear to be perfectly normal, and I do not think I have ever known two Mongols born in the same family.

I am disposed to think, therefore, that Mongolian amentia is the

* J. L. Gordon, *Lancet*, September 20, 1913.

† Dr. Bodil Hjorth, of Copenhagen, in a paper recently published on the "Etiology of Mongolism," gives particulars regarding the antecedents of twenty-one cases. "The observed conditions assumed as possible causes are phthisis in the parents or grandparents, neuropathic heredity, and alcoholism. None of these occur so often as to show a preponderating influence. There is no record of syphilis in any of the cases. Twins presenting the specific characters are noted, these children being the eighth and ninth of a family of ten. Out of the twenty-one cases, twelve were the last children in the family" (*Journal of Mental Science*, January, 1907).

result of the two factors, morbid heredity and uterine exhaustion, or some specific nutritional defect, and that with a pronounced degree of the latter the morbid inheritance may be only slight. In one of my cases there was no neuropathic heredity, but the mother had suffered from severe albuminuria and anæmia whilst carrying the child.

Pathology.—The brain of the Mongol is usually smaller and less complexly convoluted than that of the normal person. In addition, there is a diminution in the size of the pons, medulla, and cerebellum. This is not a noticeable peculiarity of ordinary ments, and it seems to be a constant characteristic of this class. Dr. A. W. Wilmarth,* as a result of the examination of five Mongols, found that the brains were of good size for imbecile brains, but that the pons and medulla were very small, being only about half the normal weight. He suggests that the low nutrition of these patients (and possibly other anatomical peculiarities) may be due to the imperfect development or absence of certain cell groups in this region.

I have had the opportunity of examining the central nervous system of a male Mongolian who died aged fourteen days. In this the weight of the complete encephalon was 340 grammes, which may be considered as normal. The weight of pons, medulla, and cerebellum was 19 grammes, the relationship between these structures and the cerebrum being thus 1 to 16·8. According to Huschke, the normal relationship between these and the cerebrum is as 7 to 93 (roughly, one-thirteenth) at birth. The relative and absolute weight of the cerebellum undergoes a considerable increase with age, however, and in the adult the proportion to the cerebrum is as 13 to 87 (roughly, one-seventh). It is thus seen that in this case there is a definite diminution of these basal structures. No other naked-eye changes were observed. Microscopical examination showed an immature condition of the cells and tracts of all portions of the encephalon and spinal cord; but the degree of development did not appear to be behind that of a normal nervous system of similar age. The brain cells of the normal child at birth are in a very embryonic condition, however, and it is hardly to be expected that any microscopical differences would be discoverable at this early age.

It is very probable that the imperfect development of the basal

* A. W. Wilmarth, "Report on the Examination of One Hundred Brains of Feeble-minded Children," *Alienist and Neurologist*, October, 1890.

PRIMARY AMENTIA (MONGOLIAN VARIETY).

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FIG. 33.—Mongolian imbecile.

FIG. 34.—Mongolian imbecile.

PLATE XII.

parts of the encephalon results in a deficient expansion of the base of the skull, and Sutherland plausibly suggests that this may be a factor in causing the characteristic physiognomy of these persons.

It may be stated that, beyond the presence of congenital malformations common to all aments, dissections have hitherto failed to reveal any abnormality of glandular or other bodily structures which would account for the peculiar characteristics of this class. The amentia is in all probability idiopathic and due to hereditary defects, but these special physical characteristics may be brought about by morbid influences or malnutrition acting during the period of intra-uterine growth.

Description—*Physical Condition.*—The three anomalies most constantly present in Mongolism, and whose combination may be said to be characteristic of this condition, are of the skull, the eyes, and the tongue. These are often so pronounced as to render a diagnosis possible at, or very shortly after, birth. In exceptional cases, however, only two may exist. In addition, there are many other peculiarities of frequent occurrence; but these are less distinctive of Mongols, many of them being by no means rare in ordinary aments. Several illustrations of this type of amentia are shown in Plates XII., XIII., and XIV.

The skull is small, rounded, and diminished in its antero-posterior measurement (brachycephalic), the face and occiput being considerably flattened. But there is no marked recession of the frontal and supra-occipital regions, so that, although Mongols are of the small-headed type of aments, the cranial conformation is markedly different to the microcephales proper. The palpebral fissures are narrow and oblique, sloping downwards and inwards. It was this peculiarity which caused Langdon Down to apply the name "Mongol" to the type; but although generally present, it is not invariably so. Dr. C. H. Fennell,* in a series of twenty-one cases, found it absent in three, whilst in one the direction was reversed. It was only present in fourteen of the twenty-eight cases described by Drs. Pearce, Rankine, and Ormond.† Moreover, it occurs in the mentally sound, and I know several remarkably intelligent persons possessing this peculiarity.

* C. H. Fennell, "Mongolian Imbecility," *Journal of Mental Science*, January, 1904. An excellent account of Mongolism as seen in institutions, based upon twenty-one cases.

† Pearce, Rankine, and Ormond, "Notes on Twenty-Eight Cases of Mongolian Imbeciles," *British Medical Journal*, July 23, 1910.

An exceedingly characteristic feature is the tongue, which is unusually large, marked by hypertrophied circumvallate papillæ, and scored by a series of irregular transverse fissures. Fennell regards this condition as pathognomonic, and says: "In the examination of the tongue in over 200 idiots of all other types, I met with none which at all recalled it." But a few Mongols of mature age do not present this peculiarity. Some very interesting details with regard to the tongue have been recorded by Dr. John Thomson,* of Edinburgh. He finds that, although the organ may be noticeably large at birth, the other characteristics of fissuring, swollen papillæ, and sodden rawness do not develop until considerably later. He says the enlargement of the papillæ most commonly begins between the third and ninth months, whilst the fissuring generally begins to appear in the course of the third or fourth year. It may be present in a slight form, however, during the second, and it may not be noticeable till as late as the sixth year. Dr. Thomson suggests that these changes may be partly due to an abnormal vulnerability of the mucous membrane, but that what chiefly determines the swelling and cracking is the habit of sucking the tongue which is commonly present in these children. I am of opinion that this is an exceedingly probable explanation, for it is an undoubted fact that a very marked feature of Mongolism is the tendency to chronic inflammatory conditions of skin and mucous membranes; whilst Thomson has shown that the exciting factor—tongue-sucking—occurs in at least 80 per cent. of these patients.

In addition to the oblique direction of the palpebral fissures, other abnormalities of the eyes are exceedingly common. Thus, ectropion and epicanthus are often seen; strabismus and nystagmus are frequent in the first few months of life, but tend to disappear as the child grows up. Speckled irides are very common, a condition to which my attention was first drawn by Dr. R. Langdon Down, who also considers that hypermetropic astigmatism is unusually prevalent. Dr. A. W. Ormond† has pointed out the extreme frequency with which cataract occurs in these patients. Out of a series of twenty-eight cases, nineteen had lens opacities, and in all but one the cataract was of a particular type. In the slighter degrees it took the form of a series of dots in the cortical portion of the lens,

* John Thomson, "Notes on the Peculiarities of the Tongue in Mongolism," *British Medical Journal*, May 4, 1907.

† A. W. Ormond, *British Medical Journal*, November 18, 1911.

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FIG. 35.—A female Mongolian. Age, 6½ months. With deep cyanosis due to congenital heart disease.

(From a photograph lent by Dr. J. Thomson.)

FIG. 36.—A female Mongolian. Age, 2 years.

(From a photograph lent by Dr. J. Thomson.)

which were so small as to be invisible by transmitted light, but were readily made out by focal illumination. In the later stages these dots increased, and produced a lamellar cataract. Dr. Ormond failed to find these changes in patients under nine years of age, and looks upon them as being of a progressive nature. I think it is quite likely the presence of these cataracts which causes the curious habit of rolling the eyes up and down and from side to side which some of these patients possess.

The ears are usually small and rounded, with a badly developed lobule. The nose is short and squat, with triangular nostrils, which often look forwards rather than downwards. The teeth do not show any special features beyond the ill-formation and proneness to decay which are common to aments in general. The hair is generally very dry, scanty, and wiry. There is frequently seen a bright red flush upon the cheeks of these patients, very much like that occurring in myxœdema. The palate is often high and narrow, the mouth open, the lips transversely fissured, and the tongue partly protruding. Adenoids are exceedingly frequent.

The hands and feet are commonly broad, flabby, and exceedingly clumsy-looking. Dr. Telford-Smith described a curious incurving of the little fingers as very characteristic of Mongolism, but in my experience it is not much commoner in this type than in aments in general. What I have frequently found is that both the little fingers and thumbs are much shorter than normal, and that whereas in the ordinary person or ordinary ament the tip of the little finger usually ends opposite the last joint of the ring-finger, in Mongols it is very common to find it extend no farther than the middle of the second phalanx. The whole hand frequently deviates towards the ulnar side. A very common characteristic is an unusually large cleft between the big toe and the next one. In the early years of life there is usually an exceedingly lax condition of the joint ligaments, and this gives rise to a greatly increased mobility, so that the fingers and knees can be hyperextended to a considerable degree. Knock-knee and flat-foot are common. The skin is rough and dry, and often covered with fine hairs. The subcutaneous tissues frequently have a curious boggy feeling, like that present in myxœdema, but there is no pitting on pressure. The abdomen is usually large and tumid, particularly in infancy, and umbilical hernia is occasionally seen.

In many of these persons the circulation is very defective, and

blueness and coldness of the extremities, sores and chilblains, are exceedingly prevalent. This may probably be due to congenital cardiac anomalies, such as imperfect closure of the foramen ovale, pulmonary stenosis, etc.; but in some instances it may be the result of intra-uterine endocarditis. Dr. A. E. Garrod* described five cases of Mongolism in which congenital cardiac lesions were found, and one-fifth of the cases examined by Dr. Sutherland presented well-marked systolic basal murmurs which were evidently congenital. It seems likely that these cases die early, since heart lesions are not very commonly found in institution patients. One very marked peculiarity of these persons is their tendency to chronic inflammatory lesions of the respiratory and alimentary tracts. Nasal catarrh, bronchitis, and diarrhœa are exceedingly common, and the majority are constant sufferers from blepharitis, rhinitis, and cracked lips. The voice is usually deep and gruff.

Such are the chief physical peculiarities of this interesting variety of amentia. It is rarely that they are all present in any one person, and there is probably no one of them which is really pathognomonic of this condition, except perhaps the tongue. This latter, with the peculiar conformation of the skull and palpebral fissures, the cheek flush, and the general tendency to mucous catarrh, seem to me to constitute the essential symptom-complex. As a rule these peculiarities persist throughout life; but I have seen a few cases in which advance of time seemed to bring about a marked amelioration, and caused them to become much less evident. This, I think, is more common in the originally milder cases; but a short time ago Dr. Caldecott, of Earlswood Asylum, showed me an imbecile whom the casual observer would hardly have recognized as a Mongol, but who in former years had possessed very well-marked characteristics.

As a rule Mongols die early, the average age at death being about fourteen years. They are rarely met with above the age of thirty years, although at the present time there are two at Normansfield between thirty and forty; and Dr. R. Langdon Down tells me that he had a female Mongolian under his care for many years who reached the advanced age of fifty-seven years. The chief cause of death is some form of tuberculosis, usually phthisis.

Mental and Nervous Condition.—The mental characteristics of this class are not so distinctive as are the physical; nevertheless,

* Archibald E. Garrod, *British Medical Journal*, October 22, 1898.

PLATE XIV.

PRIMARY AMENTIA (MONGOLIAN VARIETY).

FIG. 37.—A female Mongolian. Age, 3 months.
(*From a photograph lent by Dr. J. Thomson.*)

FIG. 38.—A male Mongolian. Age, 14 months. With talipes varus and cubitus varus. Died 2 months later of general tuberculosis.
(*From a photograph lent by Dr. J. Thomson.*)

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there are several peculiarities common to them. From the beginning, the Mongolian infant is placid, good-tempered, and readily amused. There is at first no apparent mental hebetude; on the contrary, he often looks bright and intelligent, has plenty of curiosity, is attracted by everything around him, and is very imitative. But one of the most common of the early signs of amentia is seen in the tardy evolution of the power of sitting up, walking, and talking. Moreover, he is full of grimaces and facial contortions, which are accompanied by wrinkling of the skin, and are foreign to the normal child. As he grows up the want of intellect becomes more and more apparent. But he still retains his happy disposition; he is very affectionate, readily pleased, apt to be jealous, likes to be taken notice of, and is usually a great favourite with all around him. He often has a very considerable power of mimicry, as well as a remarkable sense of rhythm and love of music, and it is quite common to find one of these children amusing a group of patients by his imitation of the band conductor, or by the playing of an imaginary violin or trombone. Many of these children are adepts at drill and dancing.

The degree of intellectual deficiency varies very considerably, and on the whole I am inclined to think that there is a direct relation between this and the intensity of the bodily signs. Many of them are merely feeble-minded, a few are pronounced idiots, but the majority belong to the medium or imbecile grade of defect. The milder members generally learn to read, write, and perform simple duties with a fair amount of intelligence, but their power of summing is decidedly poor. Dr. Shuttleworth says that some of these, after appropriate education, even pass muster with their brothers and sisters. The imbeciles, on the other hand, rarely make much headway, and, although very imitative, it is not often that in them this faculty can be turned to any practical purpose. In the performance of useful work they are often surpassed by ordinary imbeciles of far more vacant and less prepossessing appearance. Even in the milder cases the clumsy and ill-formed condition of the hands usually precludes any kind of work requiring dexterity, and most of these persons do best in the garden or on the farm. Their speech is often characterized by a persistent lalling or baby language.

Cerebral complications are not common in this class, and actual paralysis and epilepsy are rare in comparison with other aments.

It will be seen that Mongolian aments have certain points in

common with sporadic cretins, and in the early stages a considerable number are treated with thyroid gland, and hopes of amelioration held out to the parents, as a result of a mistaken diagnosis. The chief points of resemblance are the general backwardness of bodily development, with the resulting small stature, the stumpy and podgy hands and feet, the squat nose, and the bogginess of the subcutaneous tissues. Careful examination, however, will reveal far more points of difference. In the Mongols the head is small, rounded, and brachycephalic, instead of large and dolichocephalic; the tongue, although somewhat like that of the cretin in being large and protruding, is marked by hypertrophied papillæ, and later by numerous fissures. The slant of the eyes, the lax joints, and the chronic catarrh of the Mongol are very distinctive; whilst his active, bright, and vivacious manner is totally unlike the dull, expressionless inertia of the cretin. In the Mongol the thyroid gland can usually be palpated readily, whilst it is absent in the cretin, and in the latter small fatty tumours in the posterior triangle of the neck will often be felt. Finally, the rate of bodily growth is entirely different in the two conditions. I have known thyroid gland, also thymus and pituitary extracts, given to Mongols persistently for years, but never with any appreciable amelioration of the physical or mental defects; whereas, as is well known, the effect of thyroid upon the cretin is remarkable.

THE COMPLICATIONS OF PRIMARY AMENTIA.

We have described three types—namely, *Simple*, *Microcephalic*, and *Mongolian*—as the chief clinical varieties of primary amentia. Any of these three, however, may be complicated by certain severe developmental anomalies or special pathological conditions which produce more or less distinctive clinical features, and these we shall now allude to. They are, in order of frequency:

Epilepsy.
Paralysis.
Hydrocephalus.
Porencephalus.
Sclerosis.
Deaf-mutism.

It is to be remarked that, in the cases we are now considering, these conditions merely accompany and complicate a mental de-

ficiency which is primary. Similar lesions may, in a small number of instances, actually produce amentia; but such cases will be dealt with in a subsequent chapter.

Epileptic and Other Convulsions.—Convulsions in some form or other, but chiefly epileptic, are the most common complication of primary amentia. A special examination with regard to this condition in over 500 patients showed that in cases presenting no paralysis or other indication of gross cerebral lesions, and in whom therefore the attacks were probably idiopathic epilepsy, convulsions occurred in 37 per cent.; whilst in patients presenting signs of gross lesions they occurred in 70 per cent. In the great majority of the latter, however, the fits were indistinguishable from ordinary epilepsy.

With regard to the degree of amentia, it was found that convulsions occurred in 11 per cent. of the feeble-minded, 42 per cent. of imbeciles, and 56 per cent. of idiots. It is possible, however, that these figures may be somewhat too high for primary aments in general, since they largely relate to institution patients, and may therefore contain an undue proportion of the worst cases. Convulsions are most frequent in the simple and microcephalic varieties, and are relatively rare in the Mongolians.

With regard to the convulsions, as far as could be ascertained they were in the great majority of cases typically epileptic, and several of the merely feeble-minded patients have definitely affirmed the existence of a premonition or aura. In the more severe grades of defect the mental condition usually precludes any inquiry upon this point, but trained attendants can often foretell the onset of a fit by the appearance of the patient. Most of the attacks are of the major variety, although in a few cases minor seizures occur also. Their severity varies greatly, some being of the mildest possible type, others exceedingly severe and protracted. Their frequency is also subject to great variation. In some patients the first convulsion appears in the early months of life, and they thence continue almost daily during the existence of the patient. In other instances, after frequent fits during many weeks or months of early childhood, the patient remains free for years, he then has a few more, and these are again followed by years of quiescence. In yet other cases, after an initial series of fits, there is no recurrence. I have known several persons who have only experienced two or three seizures in the course of twenty years or more. It is hardly

safe to reckon on the absence of epilepsy in any particular sufferer from primary amentia, although as a rule the fits make their first appearance not later than the second decade.

The effect of the convulsions is much the same as in the ordinary individual, and appears on the whole to depend upon the frequency and severity of the attacks. If severe and often recurring, the patient rapidly loses even his limited acquirements; whilst if slight and seldom, the effect may be infinitesimal.

In addition to epilepsy, the following other conditions may be mentioned as being occasionally seen in primary aments: *Chorea* is not very common, but is found in some instances. Various forms of *athetosis* are fairly frequent in the severer grades. *Intention tremor* is occasionally seen; whilst I saw at Darenth a few years ago two imbeciles (brother and sister) affected with a constant rhythmic tremor of the whole body, closely resembling paralysis agitans. The tremor was so great that articulate speech was impossible; the fingers could not pick anything up, nor could they retain their hold of any object. In each instance the tendon reflexes were greatly exaggerated, and ankle and patellar clonus were well marked, but Babinsky's sign was absent.

Paralysis.—The next most common complication is paralysis. This, like epilepsy, is least frequent in the milder, and most so in the severer, grades of amentia, and, generally speaking, the extent of the paralysis is directly proportionate to the amount of mental deficiency. In a small number of cases, particularly amongst the microcephalics, the condition is rather one of paresis and general muscular hypotonus and helplessness than of actual paralysis, and in such it is probably due to imperfect development of the efferent pathway. In other instances it is due to the presence of a gross cerebral lesion, such as localized atrophy, porencephaly, or hydrocephaly. In these latter the paralysis is localized, and varies from a slight monoplegia to a severe hemi- or para-plegia. The affected limbs are small and ill-nourished, and often firmly contracted, and many of the worst cases are permanently chair- or bed-ridden. In a considerable number of these cases epileptic convulsions also occur.

Hydrocephalus.—Probably most cases of amentia in which hydrocephalus is at all pronounced are of the secondary form, and this condition, as well as porencephalus and sclerosis, will be more fully described in a subsequent chapter. But a few undoubted primary

aments develop hydrocephalus with its characteristic symptoms, and the condition is not infrequently found post-mortem where it had not been suspected during life.

Marked hydrocephalus usually produces enlargement of the skull (macrocephaly); but this latter condition may arise from so many other causes that it does not seem to me to merit description as a separate clinical variety, as is the case with microcephaly.

Porencephalus.—True or false porencephaly is sometimes found post-mortem when there has been little indication of its existence during life. It cannot be diagnosed with certainty, but its presence may be suspected in cases of congenital hemiplegia which are accompanied by considerable non-development of the affected limbs and marked flattening of the opposite half of the skull.

Sclerosis.—The usual indications of this complication are frequently repeated convulsions, followed by muscular tremor, weakness, or actual paralysis with contractures. In some cases there is persistent headache, the patient becomes more and more torpid, and dies after a succession of severe fits.

Deaf-Mutism is seen in a small proportion of primary aments. It calls for no remark beyond the fact that such a complication naturally imposes an insuperable barrier to successful training. On the other hand, the mild mental defect which *results* from this condition is greatly ameliorated, and in many cases removed, by appropriate education.

CHAPTER XIII

SECONDARY AMENTIA AND ITS CLINICAL VARIETIES.

HITHERTO we have been concerned with the primary form of amentia, in which the imperfection of mental development is due to innate defects of the germ cell. In the present chapter we have to deal with that small proportion of cases (probably not more than about 10 or 15 per cent. of all aments) in which there is no such inherent defect; but in which the development of a portion of the brain has been arrested by some external cause. This form, as already mentioned, is termed *Secondary Amentia.*

In many instances the distinction is obvious, alike from the family and personal history, the morbid anatomy, and the clinical appearances; but it is necessary to remember that primary aments may suffer from superadded complications similar to those producing arrest in the secondary form; also that some primary aments, although labouring under a defective potentiality for mental development, may appear to be progressing normally until the advent of some physiological epoch or slight pathological disturbance suffices to make their innate defect manifest. These latter cases in a sense form an intermediate group, and have been termed " developmental " or " delayed primary " amentia.

With the above exception there is a marked difference in the clinical aspects of the primary and secondary forms. The inherent blight of the former gives rise to numerous and widespread anomalies of anatomical development which are absent in the latter. As a consequence, the sufferer from secondary amentia is often readily distinguished from the primary ament by being well developed and well grown, and by his comely and prepossessing appearance, although occasionally there are deformities and abnormalities dependent upon the particular pathological lesion present. Further, whilst in uncomplicated cases of the primary group the general ten-

dency is for some degree of amelioration to take place as a result of suitable training, many of those of the class we are now considering are the result of cerebral lesions which are progressive, and the tendency is rather towards degeneration and ultimate dementia.

Cases of secondary amentia may conveniently be divided into two main classes. In the first of these the mental deficiency is brought about by a gross lesion of the brain; in the second it is due to some external factor influencing cerebral nutrition. Each of these classes contains several clinical varieties. This chapter will therefore be divided into two sections, as follows:

SECTION I.

Amentia due to Gross Cerebral Lesions.

Toxic, Inflammatory and Vascular Amentia, including certain clinical subvarieties—viz.:

(*a*) Sclerotic.
(*b*) Hydrocephalic.
(*c*) Syphilitic.
(*d*) Amaurotic.

SECTION II.

Amentia due to Defective Cerebral Nutrition.

1. Epileptic and eclampsic amentia.
2. Cretinism.
3. Amentia due to malnutrition.
4. Amentia due to sense deprivation.

It may be well again to emphasize the fact that, although many of the etiological and pathological conditions present in secondary amentia may, and frequently do, complicate the primary form, we are only here concerned with such cases of amentia as are directly and entirely attributable to them. The reason for including epileptic amentia in this place has been given on p. 96.

Section I.

AMENTIA DUE TO GROSS CEREBRAL LESIONS.

The cases comprised within this section owe their amentia to some vascular or toxic process within the brain. In a considerable number of instances degenerative changes sooner or later supervene, in consequence of which dementia becomes added to the mental deficiency.

TOXIC, INFLAMMATORY AND VASCULAR AMENTIA.

There are many substances which act as poisons upon the body cells. For instance, there is the inorganic group, well-known examples of which are arsenic, lead, and phosphorus. There is the organic group, instances of which are alcohol, carbon monoxide, and hydrocyanic acid. Lastly, there is the group of toxins produced by the action of micro-organisms. It is these last which we find to be chiefly concerned in the causation of amentia. In some instances the affection of the brain is secondary to some acute process elsewhere, such as pneumonia, influenza, enteric, otitis, or rhinitis; but in others the brain would appear to be involved primarily. The pathological process usually consists of either a lepto-meningitis or a polio-encephalitis (as described by Strümpell), and, as pointed out by Oppenheim,* this latter closely resembles the acute inflammation which occurs in the anterior horns of the spinal cord. I am inclined to think that many cases of amentia due to "meningitis" of obscure origin, or to so-called "sunstroke," or even "fright," may really belong to one or other of these groups.

In most instances the affection occurs within the early years of childhood, but the fact that pathological changes, consisting chiefly of numerous small foci of hæmorrhage and softening similar to those occurring in polio-encephalitis, may be found at birth, points to the possibility of a prenatal infection.†

The clinical course of the illness is subject to considerable variation. In a proportion of cases prodromal symptoms are present, the infant or child being listless and suffering from malaise for two

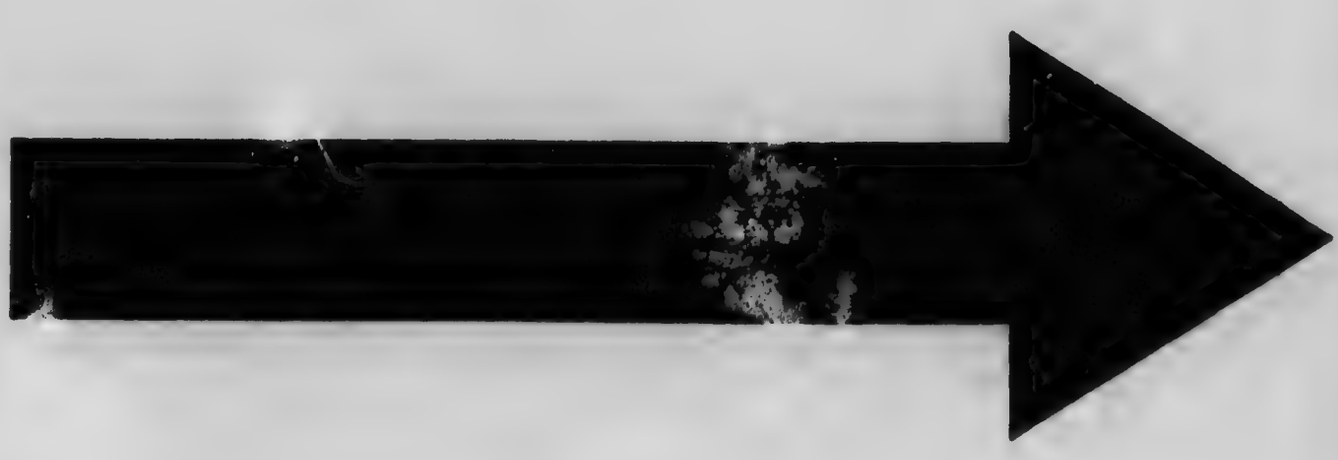
* Oppenheim, *Deutsch. Zeit. f. Nervenheilk.*, Band vi., 1895.

† Dr. G. Sutherland and Mr. H. W. Perkins recently showed a case which I take to be somewhat of this nature before the Royal Society of Medicine (November, 1912). The patient was a female child who lived for nine weeks, and on opening the skull about 9 ounces of blood-stained fluid escaped. The brain was very small, and covered with thickened, œdematous-looking pia-arachnoid, on the removal of which the cerebral lobes were found to be extremely ill-developed. The total weight of the brain was only 80 grammes. Dr. Sutherland was good enough to place several microscopical sections of the brain at my disposal for examination, and I found a swollen and infiltrated pia and numerous small foci of softening throughout the brain cortex. The nerve cells were fewer in number, and very incompletely developed, and in places showed signs of degeneration. Had such a child lived, it would have been a hopeless idiot.

or three days before any cerebral symptoms make their appearance. In most cases, however, the onset is much more rapid, and he is suddenly seized with headache, vomiting, and fever, speedily followed by unconsciousness or restless delirium, convulsions, and often paralysis. The pain in the head is usually very severe, and is a marked feature; pain in the back is also often complained of. The respiration is apt to be slow and irregular; the pulse may be slow or rapid, but is usually feeble. The temperature rarely rises to more than 102° or 103° F. The convulsions are general, and resemble those of epilepsy. Sometimes they are continuous, so that a *status epilepticus* results; but in other cases they occur as isolated fits, the patient being either delirious or comatose between whiles. Paralysis may be noticed at the onset, or it may not appear until a few days afterwards, and it may be absent entirely. When present, it usually consists of monoplegia or hemiplegia; diplegia is rare. The reflexes are increased; but there is rarely any marked disturbance of sensation. The symptoms follow no definite course, and differ considerably in different patients; but they are always such as to make it quite obvious that the child is seriously ill, and that the seat of the trouble is the brain or its meninges. These symptoms are practically the same whether the brain is affected primarily, or whether it is involved in the course of, or a few weeks after, some other condition, such as influenza or pneumonia.

In a few, but I think a very few, cases the child recovers completely. In others, after an illness of ten or fourteen days, there is a marked change for the worse; the pupils dilate, the pulse and respiration become more irregular, the coma deepens, and the patient dies. Sometimes the end comes after a series of convulsions.

In yet other cases the fever gradually abates, the convulsions cease, or continue only at rare intervals, the child recovers consciousness, and some amount of improvement takes place in the paralysis. But the psychic functions have been damaged. An impairment of the intellect may be noticed immediately on the subsidence of the acute symptoms, or it may only appear as the child begins to get about and to mix with his companions. If the child had begun to speak, he may now be speechless. His disposition may be altered, so that the persons, the playmates, and the games of which he was formerly fond are now distasteful to him. With this there is either unusual irritability or apathy and dulness, and examination speedily shows the presence of intellectual impairment. As time goes on



MICROCOPY RESOLUTION TEST CHART

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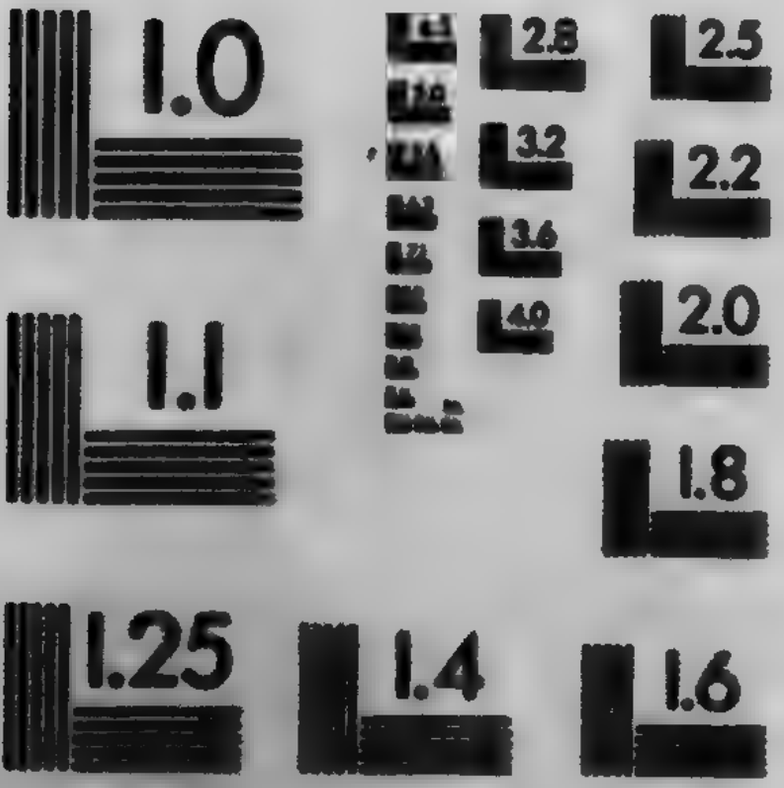

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this is seen more and more in the difficulty he experiences in learning. In a few cases recovery from the illness at first appears to be complete, at any rate to the parents, and it is only after a time, when the child begins to go to school, that he is found to be incapable of mental application and of progressing with his studies. Incurable deafness is not uncommon in cases of this kind. With regard to the degree of defect the brain lesion may be so severe that the child is rendered idiotic from the beginning; in other instances it is much less serious, but the patient cannot keep abreast of his compeers, and as time goes on he is left farther and farther behind in a state of incurable feeble-mindedness. I cannot say what proportion of children who have suffered from encephalitis or meningitis are thus rendered permanently weak-minded. No doubt, as I have remarked, very many of them die, whilst a few seem to recover completely; but the likelihood of interference with brain development is so great that the utmost caution should be exercised in giving a prognosis.

The fact that the onset of these cases is so often attended with convulsions causes them to be frequently designated "epileptic" or "eclampsic" amentia, whereas the convulsions are in reality a symptom and not a cause.

In addition to the arrest of cortical development brought about by toxins, cerebral lesions may be produced and growth interfered with by hæmorrhage, thrombosis, and embolus; also by trauma. It is this class we have now to consider. The commonest cause of these lesions is unquestionably hæmorrhage. Embolus of a cerebral vessel may occur in young infants suffering from rheumatic endocarditis; and Sir William Gowers has shown the importance of venous thrombosis, which may occur in asphyxia neonatorum or be part of a sinus thrombosis happening after birth; but both embolus and thrombus are relatively rare, and it is hæmorrhage which is responsible for the greater proportion of cases in this group. The hæmorrhage is generally meningeal, and may occur before, during, or after birth. The cases arising before birth are usually ascribed to trauma, but their causation is by no means clear. The cause during birth is usually the prolonged pressure incident to a protracted labour (Little's disease), but hæmorrhage may occasionally follow precipitate labour. The forceps have often been blamed for the bleeding, but it is very doubtful, to my mind, whether skilfully applied forceps have ever of themselves produced serious

injury to the brain, although their unskilful use may do so. After birth hæmorrhage may result from a direct injury in the shape of a fall or blow, or it may occur during a severe paroxysm of whooping-cough; whilst trauma may result in a laceration of cortical tissue without pronounced hæmorrhage.

In the great majority of the birth cases, which is by far the most numerous group, the child presents well-marked asphyxia when born, from which he is resuscitated with considerable difficulty. For several days he remains torpid, with feeble pulse and respiration, tense anterior fontanelle, and contracted pupils. He does not cry, and requires much rousing before he will take food. His muscles are rigid, opisthotonos may be present, and convulsions are frequently seen. A little later on evidence of paralysis in one or more limbs is noticed. Sitting up, walking, and first attempts at speech are all delayed, and it is gradually borne in upon the parents that the child's mind is not quite the same as that of other children. In the milder cases the initial symptoms may rapidly pass off, and it is only when the child begins his schooling that deficiency is noticed, and that he is found to be unable to make any mental effort.

Paralysis is a very common feature of these cases. Jacksonian or epileptic convulsions occur in a considerable proportion; whilst athetoid or choreiform movements are also frequently seen. There is usually some flattening of the skull over the affected side. Many of these children are small and delicate, and there is no doubt that a large proportion die in the early years of life, some of convulsions, others of ordinary children's ailments. But others thrive and get fat, and may live for many years. There is not as a rule any pronounced sensory disturbance, although sometimes hearing is impaired. The amentia varies from a mild degree of feeble-mindedness to gross inarticulate idiocy.

Factors influencing the Causation of Amentia in Toxic and Vascular Lesions.—I have dealt with the toxic and vascular cerebral lesions separately up to this point, because at their onset they present marked clinical differences; we may now consider some points applicable to both of them. It is probable that the total number of children affected in one or other of the modes described is not inconsiderable, and where such symptoms are at all severe, the majority die. Others, but relatively few, appear to make a complete recovery. In yet others death does not take place, but a permanent

legacy remains in the shape of a gross cerebral lesion. It is this latter group with which we are here concerned.

It is by no means to be assumed that the child who emerges from an illness of this kind with a gross lesion of the brain will necessarily be mentally defective. The effect of the lesion upon the patient varies very much, and in the main three phenomena may result, either singly or in combination—namely, *paralysis*, *epilepsy*, and *amentia*.

It is sometimes stated that if paralysis results from these lesions it is sure to be accompanied by some amount of mental deficiency. This is a complete mistake; not only may marked paralysis occur without amentia, but amentia may be present without paralysis. I have seen quite a considerable number of cases in which there was paralysis of hand and forearm or foot and leg, or even of two limbs, without the slightest intellectual impairment; indeed, in some of them the mental capacity was decidedly above the average. Dr. Sigmund Freud,* who has made a most careful study of the question, says: "Idiocy does not show any constant relationship to the other signs of infantile cerebral paralysis in respect of the degree of psychic arrest. There are cases of the severest paralysis with the intelligence scarcely affected, as, on the other hand, complete idiots without any signs of paralysis."

With regard to epilepsy the case is somewhat different, and where the initial pathological process is such as to produce frequently repeated convulsions, there is a strong probability that some degree of amentia will result, and that dementia will ultimately supervene. But in these cases this result is by no means invariable, and it occasionally happens even in them for intellectual development to show no sign whatever of having been adversely affected. In exceptional cases it may even happen for the mind to show no trace of defect where *both* paralysis and epilepsy are present.†

* Freud, "Infantile Cerebrallähmung," Wien, 1897.

† A good example of this was described by the writer in an article on "Amentia" in Mott's "Archives of Neurology," vol. ii. In this case there was right hemiplegia, with constant epileptic fits from birth, probably due to asphyxia neonatorum. The patient died, aged thirty-five years, from exhaustion following a series of fits, and post-mortem examination revealed chronic meningo-encephalitis of the whole of the motor region of the left hemisphere. There was also considerable non-development of this hemisphere, its weight being 105 grammes less than the right, and there was chronic interstitial sclerosis, with diminished number of nerve fibres, throughout the corresponding upper efferent tract. The motor lesion had been

Finally, in a certain number of cases these infantile lesions give rise to amentia, with or without either or both paralysis and epilepsy. It is thus seen that these infantile cerebral lesions are attended with widely different results, and although in this place, of course, we are only concerned with those in which amentia occurs, it will not be out of place to consider the reason for such diversity.

Two possible factors influencing the result are the age of the patient when the lesion occurs and the inherited potentiality of the neuroblasts. In the new-born child cortical lamination is not yet complete, and there are a large number of neuroblasts lying among more fully developed nerve cells. I am inclined to think that a considerable number of these never attain mature development, for such immature cells may often be found in middle life. In this, as in other matters, Nature seems to act lavishly, and to provide a far greater number of cells than are developed by the stimulus of incoming sensations which comprise "education." In fact, there appears to be a potentiality for cerebral development exceeding that usually attained by the individual; in other words, a developmental reserve which is never fully drawn upon. With the lapse of years, doubtless, this capacity of the embryonic cells becomes progressively less, and hence the older the child the more serious is likely to be the result of one of these lesions. Before cortical lamination is complete, however, I see no reason why their inherent potentiality should be inferior to others amid which they lie. Consequently it is not improbable that the destruction of nerve cells caused by a lesion occurring at or shortly after birth may be *compensated* by the development of these embryonic cells; and where the two hemispheres have a function in common, it may even be possible for such compensation to take place in the opposite side to the one affected. This view, of course, is largely hypothetical, but it finds support in a number of clinical facts which are otherwise extremely puzzling.* Thus, many cases have been recorded in which the greater part of

compensated to a great extent by a numerical increase of Betz' cells of the opposite hemisphere. And yet this patient showed no trace of amentia, and, in spite of his paralysis and epilepsy, was able to earn his living until nearly twenty years of age. He was then admitted to the workhouse in consequence of the fits, and subsequently transferred to the asylum on account of post-epileptic insanity. At the time of his death there was practically no dementia.

* Dr. G. Anton has drawn attention to the possibility of compensation thus taking place in the opposite hemisphere in an interesting article in *Monats. f. Psychiat.*, January, 1906.

one cerebral hemisphere was practically useless by reason of porencephaly or hemiatrophy, and yet the mental and motor defect was but slight; indeed, in a large number of these cases the clinical signs (particularly of paralysis) are astonishingly insignificant when compared with the state of the encephalon.* Moreover, in the case already referred to, where practically all the large motor cells (of Betz) of the left leg area had been destroyed by a vascular lesion during birth, I was able to demonstrate a compensatory increase in the corresponding cells of the opposite hemisphere.

A diminished neuronic potentiality, due to slight morbid heredity, is the explanation of those cases of so-called "developmental" amentia which apparently result from a comparatively trifling cerebral lesion or general disturbance of health, and in all probability in the cases we are now considering the effect of these lesions upon the intellectual capacity of the patient is in no little measure influenced by his hereditary predisposition. One would also imagine that the ultimate amount of physical or psychic impairment in these cases would be considerably influenced by the amount of special training received by the patient during infancy.

With regard to the kind of lesion, there is so much variation that I find it very difficult to make a precise statement; but my general experience is that mental deficiency is more likely to occur, and to be more severe, in the toxic than in the vascular cases. This may not be due so much to the nature of the lesion, however, as to the age at which it occurs; for most of the vascular cases occur at birth; but the toxic ones not until the early years of childhood, when compensation is much less likely to result.

Another very important factor influencing the prognosis in these cerebral lesions is their situation and extent. If confined to the motor cortex or its downward prolongations, the result will probably

* On this subject see a very interesting article on "Secondary Degeneration following Cerebral Lesions," by W. G. Spiller (*Journal of Nervous and Mental Disease*, New York, January, 1898). Dr. Spiller describes the case of a boy in whom "the motor fibres of the left cerebral hemisphere were totally destroyed, and yet the boy was able to walk without a crutch, although in an imperfect manner; he had no use of the right upper limb." Spiller says: "The conviction is forced upon one that the motor fibres to the right lower limb were transmitted through the pyramidal fibres from the right cerebral hemisphere. . . . The nervous system can adapt itself much better to altered circumstances if destruction of tissue occurs before the nerve cells and fibres are fully formed, and it would seem that even additional fibres may develop." He quotes several similar cases which have been recorded by von Monakow, Mahaim, Déjérine, Thomas, and Zacher.

be paralysis without amentia. In a considerable number of cases, however, lesions of the motor cortex also produce convulsions which may at first be Jacksonian, and ultimately become typically epileptic. It may even happen for a subcortical focus of disease to produce similar convulsions.* As a consequence of these convulsions amentia and dementia may be induced. A lesion in or near the motor cortex may exceptionally cause epilepsy without paralysis, and here also the convulsions may bring about subsequent mental deterioration; in such cases paralysis may supervene later. A lesion elsewhere may give rise to epilepsy, either by acting as a source of reflex irritation, or by causing an increased intracranial pressure. Finally, a lesion of the more purely psychic areas (probably the frontal, prefrontal, and parietal lobules) may produce amentia without either paralysis or epilepsy. It is necessary to remember that not only may secondary pathological changes be induced by any of these lesions, but that an arrest of development may occur in far-removed portions of the encephalon which are functionally correlated. The involvement of both hemispheres, as shown by diplegia or paraplegia, is of far more serious import than where one side only is affected.

In view of the widely differing effects of these cerebral lesions, it is obvious that no accurate forecast is possible. Of the children born with asphyxia, the number in whom amentia results is exceedingly small, and careful observation of the child for a few days will usually enable the physician to reassure the parents on this head. Of the cases happening during early childhood, the proportion who become aments is much larger, and this possibility can never with certainty be excluded until the lapse of some time after the illness. If diplegia or paraplegia be present, then it is highly probable that some degree of mental deficiency will result. Apart from this, however, the degree of paralysis affords no indication as to the amount of psychic damage. There may be extensive hemiplegia with no intellectual defect, or there may be profound amentia with but trifling or even no paralysis at all. Even were one able to exclude all involvement of the psychic areas, there would still be the possibility of recurrent epilepsy, and the consequent induction of amentia and dementia.

The mental deficiency in these cases may be slight or severe.

* Such a case was described by the author in Mott's "Archives of Neurology," vol. i.

Some patients are merely feeble-minded, and beyond a general simplicity and childishness, an inability to get on at school and to fend for themselves, they are capable of a considerable amount of useful work under supervision. Others belong to the imbecile grade, and are capable of very little; others are idiots. In some persons the defect seems to be more particularly marked in certain faculties; thus, we find that in some the memory is chiefly affected, in others the attention or the power of speech. In disposition and behaviour some of these aments are placid, contented, affectionate, and trustworthy, but others are very emotional and undependable. I am inclined to think that a suspicious disposition and general irritability of temper, together with a liability to be easily upset and to commit impulsive actions, are very common characteristics of patients suffering from these varieties of amentia. As already remarked, there are no stigmata of degeneracy, and in such of these persons as are not paralyzed the bodily development and nutrition are usually good. Often, indeed, as Langdon Down said, they are of winsome and comely appearance.

It is impossible to formulate more than very general rules as to the prospects of improvement in these cases. On the whole, if the case is really a secondary one, and not a case of primary amentia complicated by a gross cerebral lesion, and if convulsions are not frequent, there is a likelihood of a fair amount of improvement under proper educational methods. But such training must be begun early to be of much avail, and, unfortunately, one finds a very great tendency to postpone it until too late, under a mistaken trust that the child will "grow out of it." The extent of paralysis is no criterion as to the possibility of improvement. Some of the most hopeless cases are those in whom there is no paralysis, whilst some of those who suffer from a severe physical handicap may be taught to perform really useful work. Recurring convulsions are of much more unfavourable import.

Paralytic Aments.—In a large proportion of these vascular and toxic cases paralysis is present, and such may conveniently be described as *paralytic aments*. The amount of paralysis varies enormously, ranging from a partial monoplegia to a hemi-, di-, or para-plegia. In some cases the only observable defect may be a want of opposition of the thumb of one side; in others there is a severe hemiplegia, accompanied, it may be, by some weakness of the opposite foot. In the birth or asphyxial cases, double

talipes equino-varus is not uncommon; both legs may be completely paralyzed, and occasionally spastic paresis of the legs may be accompanied by an inability to perform certain fine movements of the hands. As a rule the face and tongue are not involved. In addition to being paralyzed, the affected limbs are much smaller than the corresponding healthy ones, and may be cold and livid. In course of time rigidity and shortening take place, with the development of contractures and abnormal postures. The reflexes are usually exaggerated, and Babinsky's toe sign is frequently present.

In some paralytic aments convulsions are a prominent feature. As a rule, in their onset, course, and post-convulsive state these are indistinguishable from those of ordinary idiopathic epilepsy; but in some cases they are of a Jacksonian character. In one of my patients both localized and general convulsions occurred, the former unattended by loss of consciousness; but they gradually passed into the typical epileptic variety, and I think this is the tendency in most of these cases where the fits begin as Jacksonian. Sometimes paralysis may exist for years without any fits, and then epilepsy suddenly makes its appearance. Petit mal also occurs. In a few cases there is seen a constant rhythmic tremor or irregular choréiform movements without epilepsy. As will be mentioned, those cases the origin of which is marked by a series of convulsions are often described as *eclampsic amentia*, whilst those in which the fits continue, and have the characters of epilepsy, are spoken of as *epileptic amentia*. In my opinion, however, this latter term should be restricted to cases of amentia due to idiopathic epilepsy without a gross lesion.

Final Lesions.—It is necessary to remember that in course of time secondary changes take place in and around the initial lesion, so that the final product is often very different to the change in the first instance, and it is then usually impossible to say whether the lesion was originally vascular or toxic. The chief ultimate results, as seen in post-mortem examinations made many years afterwards, are localized areas of softening, atrophy, sclerosis, heterotopia, and agenesis; cysts, meningo-encephalitis, porencephaly, hemiatrophy, and occasionally hydrocephaly. Sometimes these secondary changes give rise to more or less distinct varieties, which may be recognized clinically, and these will be described in subsequent pages.

Illustrative Cases.

Medium-Grade Amentia, with Hemiplegia and Convulsions, the Result of a Birth Injury.—M. B., female. No family history obtainable. The patient has had fits and paralysis since a baby, due to an injury at birth. She went to school for a few years, but could never learn. At twelve years of age was admitted into workhouse in consequence of death of parents. Was thence sent into the asylum owing to epileptic fits. She is now twenty-two years of age, and has been under my observation for two years. She is a placid, simple-looking girl of apparently seventeen years or so, rather small, but well-nourished, and devoid of stigmata of degeneracy. There is left hemiplegia involving the leg, arm, hand, and lower part of the face. The reflexes are exaggerated on both sides, and there is slight lateral nystagmus. No impairment of sensation can be made out. She is subject to convulsive attacks without loss of consciousness, the duration of one of which has been as long as two hours. These consist of clonic movements of the left (paralyzed) hand and arm, with twitching of the left corner of the mouth, and drawing of the head to the left side. During the attack the knee-jerks are exaggerated (particularly the left), but there is no ankle clonus, and the pupils are normal. She says that the attacks are preceded by a "feeling" under the left arm, and that whilst they last she feels pins and needles in the left face, arm, and leg. Some of these attacks are followed by a state of general rigidity, with loss of consciousness. In addition she has petit mal and convulsions which are typically epileptic. Her mental condition is that of a high-grade imbecile. She can carry on a simple conversation, but does not volunteer information, and she will agree to almost anything suggested to her. She cannot read, but can just scrawl her name. She can count up to thirty, but cannot say what two and two make. She will do what she is told, and helps in the ward-cleaning. Her memory is poor; she has no idea of time or dates, but her attention is tolerably good. She is occasionally mischievous and takes things from the other patients, but on the whole is well-behaved and gives little trouble.

Amentia with Double Talipes due to Asphyxia Neonatorum.—M. F., female. There is nothing abnormal in the family history. The patient is the fifth of a family of ten; two died in infancy, the remainder are healthy. The mother tells me that *M. F.* was a very

SECONDARY AMENTIA DUE TO EPILEPSY.

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FIG. 39.—A case of epileptic amentia. Age, 20 years. Indications of dementia present.

SECONDARY AMENTIA DUE TO CEREBRAL LESION.

FIG. 40.—M[illegible] amentia with epilepsy and right hemiparesis due to cerebral l[illegible] when one year old. Frequent fits, very passionate and impulsive [illegible] times, becoming demented. Age, 30 years.

large child that the labour was very prolonged, and that she was so blue and lifeless at birth that the doctor in attendance had to make "a opening in her throat." I do not know what this could have been, and can find no evidence (at seventeen years of age) of any tracheotomy scar; but there seems little doubt that the child had severe asphyxia neonatorum. The mother says she was quite "dummy" from birth, and utterly different to the other children; that she had severe fits whilst cutting her teeth, did not walk until four and a half years, and never said a word until she was in her sixth year. She went to school, but could not learn, and she afterwards had several situations, but could not keep them, as she seemed too simple and childish. At the age of seventeen years she began to get very troublesome and spiteful; she was considered a danger to the younger children, and sent to the asylum.

Upon admission she was a fairly well-grown girl, with a decidedly childish and vacuous expression. There was no observable sensory defect. She could understand what was said to her, and was capable of replying to simple questions. She could read and write words of one syllable, and could add up to ten. On the whole she was quiet and well-behaved, and did a certain amount of work in the laundry under supervision; but she had no power of reasoning, and was obviously far too deficient to earn her living. She was of a remarkably facile disposition, and readily assented to any proposition made to her; she also had a considerable defect in the power of sustained attention. Speech was exceedingly indistinct. She had double talipes varus, with some dragging of the feet in walking, but no other signs of paresis. She is now nineteen years of age, she has had no fits since childhood, but her mental deficiency is becoming more marked. She is at times rambling and incoherent in her conversation, but is on the whole well-behaved and gives no trouble. The slight paresis of the feet is somewhat more pronounced than formerly, and the knee-jerks are exaggerated.

Amentia due to Trauma.—*S. V.*, female. The patient is the sixth of a family of ten; two sisters died in infancy, but the remainder are well grown and quite healthy in body and mind. A complete family history was obtained, and revealed an entire absence of morbid heredity. *S. V.* was born at full term without any abnormal circumstances. She cut her teeth, walked, and talked at the ordinary age, and, in fact, appeared to be a perfectly healthy child until four years of age. She then had a fall in the

street, striking her head against the curb; she remained unconscious for half an hour, and then came to, but seemed dazed. Five weeks afterwards she had her first epileptic fit, and they have continued almost daily since. I saw her for the first time at the age of fourteen years. She was tolerably well grown for her age, and had no stigmata of degeneracy, although quite idiotic in manner and facies. She did not understand all that was said to her, but could obey some commands by signs. She was incapable of any kind of work, and could not dress or feed without help. Constantly wet and dirty. Could say a few monosyllabic words, but most of her utterances were inarticulate grunts. She was said to be good-tempered and quite harmless. On careful examination, I found that there was slight dragging with eversion of the right foot. The right face was also less full than the left, but there were no other localizing symptoms. The fits were typically epileptic, and followed by a prolonged period of unconsciousness. I came to the conclusion that the case was probably one of combined amentia and dementia, the result of traumatic epilepsy, and although I thought it very doubtful whether anything could be done so long after the injury, I recommended operation as a justifiable and the only possible measure.

Mild Amentia, with Paralysis and Convulsions, consequent upon "Infantile Hemiplegia."—F. D. W., male. No morbid heredity. His brothers and sisters are healthy in body and mind, and the patient appeared perfectly normal until his second year. He then had a severe illness, which left him paralyzed in the right hand and arm, and a few years later he was noticed to be more simple than other children of his age. He went to school, but could never get on, and he cannot read, write, or sum. Upon leaving school he used to help his father (who is a publican) in the bar, but he has never followed any regular employment. He was subject to occasional epileptic fits, and after one of these assaulted his father and sister, and became so unmanageable generally that he had to be sent to an asylum, where he has since remained. He is now forty-two years of age, and is a well-developed man of medium height, with no stigmata of degeneracy. His facial expression is placid and somewhat childish. There is dropping of the right wrist, and the interossei as well as the muscles of the thenar and hypothenar eminences and forearm are very little developed. The whole of the right forearm is short and stunted,

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FIG. 41.—Mild amentia with paralysis and convulsions, due to infantile lesion.

FIG. 42.—Mild amentia with paraplegia, due to vascular lesion at birth.

as compared with the left. He can make use of the affected arm for coarse purposes, but he cannot perform fine movements. He cannot move the toes of the right foot, and they are cold and blue, but there is no other observable paralysis of this or any other portion of the body. There is no sensory defect, and he has had no fits for several years. His memory is only fair, and is better for remote than recent events. His power of attention is good, and he has no special sense defect. He can carry on a simple conversation, and can give a tolerably good account of his past life; but his general intelligence is poor, and he is too childish to take care of himself without supervision. He is very suspicious of strangers, and very disinclined to answer their questions. He is emotional, and readily moved to laughter or tears. He is very variable in temper, and at times surly, perverse, and very troublesome, but at others he is a not unwilling worker in the dormitories. (See Plate XVI., Fig. 41.)

Mild Amentia with Paraplegia, due to a Cerebral Lesion during Birth.—T. W., male, aged thirty-three years. Owing to the death of the patient's parents a complete history is unobtainable, but, as far as can be ascertained, there is no morbid heredity, and the condition is the result of a lesion during birth, which left the patient paralyzed in both legs and mentally defective. He has been in institutions since childhood, and although he has learned to read and write fairly well, and even to do simple sums in arithmetic, the absence of any systematic manual training, together with his general intractability, causes him to be quite unemployed. He has an alert, and at times a decidedly cunning, look, and his features are of a low animal type, but there are no pronounced stigmata of degeneracy. The skull is symmetrical and larger than usual, the circumference being 23 inches. Both lower limbs are completely paralyzed from the thighs downwards; they are also very small and imperfectly developed, blue and cold, and covered with a plentiful growth of hair. Tactile sensation is markedly diminished in the paralyzed limbs, and the knee-jerks and plantar reflexes are absent. Walking is impossible, but the patient is very adept at propelling himself along on his haunches by making use of his hands and arms as levers. There have never been any convulsions. There is no defect of the special senses. He understands most of what is said to him, and can reply, but usually refuses to do so. His memory is good; he is very observant, and capable

of simple reasoning; but he cannot follow an argument, and his ideas and general behaviour are characterized by a childish simplicity. The powers of attention and control are markedly defective. If asked to write his name, he takes the pencil in his hand, looks at it, and then puts it down to look at his arm. He then takes it up again and makes a start, but drops it to scratch his back. Another beginning is interrupted to look at someone coming in at the door. In fact, he is as inquisitive and curious as a monkey, and so distracted by everything happening around him that he can settle down to nothing. He is destructive and constantly tears up his clothes, and from time to time he has outbreaks of noisy violence, during which he uses disgusting language and attacks anyone who may be near him. (See Plate XVI., Fig. 42.)

Amentia with Epilepsy, due to "Sunstroke."—E. S., male. The eighth born of a family of nine, all the others being healthy. There is a tendency to alcoholism on the parental side, but no insanity, epilepsy, or consumption. The patient seemed perfectly well until three years of age. Dentition had been normal; he was able to walk well, and was making progress with his talking. When just turned three he had "what the doctor called meningitis" following exposure to a severe sun. The mother says that for nine weeks he was unconscious and repeatedly convulsed. For twelve months after this he never uttered a syllable; he then began to pick up a few words again, but made little progress, and his parents noticed a profound change in him. Usually he was dull and stupid, and seemed to have little sense, but at times he became violent and unmanageable. The fits continued at short intervals, and at the age of nine he became so troublesome that he had to be sent to the asylum. On admission he was somewhat undersized for his age, and poorly nourished. His features were good, and there were no stigmata of degeneracy, but the expression was vacant. Fits occurred daily; they were very severe, preceded by cry, followed by a period of unconsciousness, and had all the characteristics of true epilepsy. He could understand what was said to him, and would occasionally reply, but as a rule he was moody and silent, and resented being questioned. He was incapable of any employment. The patient steadily became worse. He was a confirmed masturbator and addicted to swallowing pebbles. He became wet and dirty, required to be fed, and needed constant attention. He took no notice of his surroundings, did not seem to understand what

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FIG. 43.—Amentia with epilepsy, due to encephalitis at 3 years of age. Becoming demented.

FIG. 44.—Pronounced imbecility due to encephalitis in infancy. Mischievous, destructive, and intractable. Age, 9 years.

PLATE XVII.

he was told, and if examined became very resistant and forbidding. At times he would sit in a chair flapping his arms and making hideous noises; at others he was moodily silent. He died, at the age of seventeen years, of exhaustion after a series of fits.

On making a post-mortem examination, I found the skull very thick and dense, the diploë being obliterated. The brain was small, and weighed 37½ ounces, the left hemisphere being 5½ ounces less in weight than the right. The ventricles were dilated, and there was considerable excess of clear fluid. The membranes appeared normal. The brain was tolerably well convoluted, and presented nothing abnormal externally beyond a general diminution of size. On making careful sections, however, a localized area of softening, about the size of a filbert, was found in the left supramarginal convolution at the junction of the grey and white matters. This in all probability was of vascular origin, and the final result of the attack of encephalitis which took place at three years of age. (See Plate XVII., Fig. 43.)

Mild Amentia with Motor Aphasia, due to an Infantile Cerebral Lesion.—*N. T.*, male, born in India, the second child of a family of six. Parents healthy, and no morbid heredity. Seemed perfectly normal until nine months old, when he had a series of convulsions lasting three days. These continued, at intervals of a few months, until he was three years of age; they were attended with unconsciousness, and in the last attack he was given up by the doctor. He recovered, however, and has had no further fits; but from that time his parents noticed a great mental change. He failed to understand what was said to him, became restless at night, exceedingly dirty in his habits, and required constant watching during the day to prevent him destroying everything he could lay his hands on. As time passed some improvement took place; he became more manageable, and able to do little things for himself. He would also help his mother in laying the dinner-table and similar household duties, but he could not be depended upon, was at times very intractable, and was quite unable to speak.

I first saw him at the age of eleven years. He was a sturdy, well-developed boy, with good features but a decidedly vacuous expression. There was no sensory defect; he could understand simple commands and remarks; but he was obstinate, and took little notice of anything said to him. He could whistle, but could not articulate, and he was passionate and untrustworthy. As far

as could be ascertained in the absence of conversation, his general intelligence was about equal to that of a normal child of five or six years. I came to the conclusion that the case was one of mild amentia caused by meningo-encephalitis or some toxic process involving the motor speech centre, and considered the prospect of improvement slight, but recommended special training in an institution. This has now been carried out for three years. He has improved greatly in habits and general behaviour; he is now thoroughly obedient and dependable, and evinces an affectionate disposition towards those about him. He is fond of manual work, and can perform many kindergarten occupations, such as plaiting and bead-threading, very well. He lays the dinner-plates with a marvellous dexterity. He has learned to make pot-hooks and hangers, knows some of his letters, and can count up to six. But he finds school-work very uncongenial, and cannot settle down to it. He seems incapable of making any mental effort. He understands all that is said to him, but still remains unable to articulate, and, in spite of persistent attempts to teach him, the nearest approach to a word he can utter is a guttural "cuckoo."

Mild Amentia consequent on "Meningitis" at Fifteen Months of Age.—K. G., male. Was born in India, and has four brothers and sisters alive and well. His mother is an exceedingly delicate, neurotic woman, his father strongly addicted to alcohol; but there is no history of epilepsy or insanity on either side. The patient seemed all right until fifteen months old, when he was laid up for two months with some brain illness, accompanied by fits, which is described as "meningitis." From this time he became subject to fits of irritability, and showed indications of mental defect. He went to school at the age of seven, and showed a considerable taste for drawing and manual work; but he was never able to make progress in any studies, and seemed incapable of mental application. I saw him in consultation at the age of eleven; he could then read and write simple sentences, and was capable of simple addition and subtraction sums. He had a good memory, and could recount a few historical and geographical facts, but his manner was very restless and his attention very fitful; he was quite incapable of settling down to school-work, and his general intelligence and power of reasoning were no greater than those of a normal child of six years. Cranial circumference, 21⅝ inches. He was affectionately disposed to those about him, but of a very undependable temper.

Was addicted to hiding up trifling objects of no value, and had wandered away from home on several occasions. At times he was destructive, and would tear up clothes, toys, and picture-books indiscriminately. Occasionally he was noisy and aggressive, and had attacked those about him. He improved very considerably under special training, and there seems every probability of his being able to follow an occupation under supervision.

Amentia accompanied by Porencephaly or Cerebral Hemiatrophy.—As seen in the post-mortem room, these cases appear to be widely different from those just described, in which the pathological findings are cysts, localized atrophies, softening, meningo-encephalitis, and the like. Here we have to do with a condition of porencephaly or hemiatrophy of such an extent that the affected hemisphere may be 200 or 300, or even more, grammes less in weight than the opposite one, and it would seem as if such must be accompanied by special clinical features. In some instances this is so, and on that account it is desirable to refer to these conditions separately. But, on the other hand, it must be admitted that these severe conditions can often only be suspected during life, and that they are by no means rarely found after death when there had previously been nothing to suggest that more than a minor pathological disturbance was present. An interesting case of this nature has been recorded by Conolly Norman and Fraser.* It was that of a very fine female who had never been under restraint, and who presented no external evidence of extensive brain disease in the shape of atrophy, contractures, etc., and yet post-mortem there was found extreme wasting of one hemisphere, as well as of the corresponding basal ganglia. Many similar cases in which the clinical signs have been comparatively slight have been recorded by other writers—viz., Van der Kolk, Bianchi, Heschl, Spiller, Lambl, etc.

In most cases these conditions are the result of disease, and date from very early infancy, if not from uterine existence; a few, however, seem to be due to primary anomalies of development. But the distinction can only be inferred clinically, and not always made with certainty upon dissection.

During life an ament may be suspected to be the subject of porencephaly or extensive hemiatrophy if there is severe hemi-

* Conolly Norman and Alec Fraser, "A Case of Porencephaly," *Journal of Mental Science*, October, 1894.

plegia accompanied by contractures and marked non-development of the affected limbs, and if convulsions are also present. But, as already remarked, the hemiplegia, in some cases of pronounced porencephaly discovered post-mortem, is often astonishingly insignificant, and it rarely involves the tongue or face. The convulsions are of the usual epileptic type, and are fairly frequent, but cases have been recorded in which they were absent. Sometimes much headache is complained of. The diagnosis is rendered more probable if, in addition, there is marked flattening of one side of the skull, but in many of these cases the space is filled up by excess of fluid or growth of the inner table, so that the external conformation of the skull is not altered. I know of no other distinguishing features. The amentia may be of any grade, from a mild imbecility to gross idiocy, and stigmata of degeneracy may be present or absent according as the case is one of primary amentia complicated by these lesions, or one of secondary amentia due to them. In the latter dementia often supervenes, and death frequently results from tuberculosis or follows a succession of fits. Of Kundrat's* series of eighteen cases of porencephaly, only three survived the period of infancy.

Illustrative Cases.

False Porencephaly with Cystic Formation.—A. E. W.,† female. Imbecile. No morbid inheritance. Born paralyzed on right side. Constantly suffered from headache and epileptic fits. The paralysis involved the right arm and leg, but not the face. The affected limbs were smaller and shorter than the sound ones. There was talipes equino-varus of the right foot, but no contractures. The knee-jerks were absent. Speech indistinct, memory poor, depressed and dull mentally. She was subject to frequent fits, beginning in the affected side, and then becoming general. She gradually became more and more demented, and died at the age of twenty-two, after a succession of severe fits.

The post-mortem examination showed extensive atrophy of the lower part of the motor region on the left side, and of the corresponding efferent tract in the pons, medulla, and cord. The

* Kundrat, "Die Porencephalie," Gratz, 1882.

† For a fuller description of the histological appearances in this and the following case, see "Hemiatrophy of the Brain," by Mott and Tredgold, *Brain*, part xc., 1900.

depression in the brain was occupied by a subarachnoid cyst. The left ventricle also was greatly dilated. The weight of the left hemisphere was 435 grammes, and of the right 585 grammes.

Cerebral Hemiatrophy with Ventricular Dilatation.—J. E., male. Fits, paresis of right arm, and weak-mindedness from infancy. The right leg also weak, but he was able to walk, and he had been engaged as a shoeblack. He was admitted into the asylum at the age of twenty-six in consequence of frequent epileptic fits accompanied by attacks of noisy excitement. On several occasions he had attacked those about him without provocation. He gradually became demented, and died, aged thirty, of acute phthisis.

On post-mortem examination the skull was symmetrical externally, but there was marked thickening of the whole of the inner table on the left side. In some situations the thickness was more than twice that of the opposite side. The weight of the right hemisphere was 575 grammes, that of the left but 155 grammes. The left ventricle was hugely dilated, the substance of the hemisphere being reduced to a mere shell in places. The left basal ganglia, particularly the optic thalamus, were also exceedingly small and ill-developed. There was consecutive atrophy of the left crus, pyramid and fillet in the pons and medulla, with atrophy of the right half of the cerebellum and its superior peduncle. There was also sclerosis of the left direct and right crossed pyramidal tracts in the cord, of the left antero-lateral column, and marked numerical diminution of the anterior horn cells in the cervical and lumbar regions.

The following description, by Dr. Ross, of a case of *double true porencephaly* (which is exceedingly rare) is quoted by Ireland:

"The patient was a little girl who died of croup at the age of two years and five months. At the age of three months her parents first observed that she could not hold her head up, and that her hands were stiff. She never at any time suffered from convulsions. The child was small for her age, but fairly nourished. The legs were kept in a half-flexed condition, the feet extended, and the heels drawn up. The arms were held semiflexed in a symmetrical position. The muscles of both extremities were in a state of spasmodic rigidity. Any attempt to alter by passive motion the position of the limbs caused increased spasmodic contractions. The head was kept bent forwards, the chin upon the sternum; but she could raise her head by an effort, soon again to fall into the

old posture. She could voluntarily grasp an object with each hand, but the movements were irregular and uncertain. She could only utter a few monosyllables."

"On examination after death, a deep sulcus was found in each side of the brain, about the site of the fissure of Rolando, extending from the point of bifurcation of the Sylvian fissure for about 1½ inches upwards. Each sulcus opened into the corresponding lateral ventricle by an aperture the size of the little finger. Each opening was surrounded by a ring of grey matter having all the naked-eye appearances of the cortex. The ascending frontal and ascending parietal appeared to be absent, and the surrounding gyri were displaced. The crura cerebri, pons and medulla appeared quite normal to the naked eye." Microscopical examination showed that the cortex contained a number of imperfectly developed cells almost destitute of processes. The anterior pyramids of the medulla also were not more than half the size of those of a normal child of corresponding age, and the lateral columns of the cord were also diminished in size.

Bourneville* has recorded six cases of cerebral hemiatrophy, of which the following are synopses. All the patients were imbeciles or idiots, and almost all suffered from epileptic convulsions and showed post-mortem sclerosis, atrophy, and chronic changes in the membranes and brain tissue.

1. Pseudo-porencephaly. Fifteen years old. Left hemiplegia with epilepsy. Right hemisphere, 240 grammes. Left hemisphere, 560 grammes.

2. Imbecile. Twenty-one years. Right hemiplegia and epilepsy. Right hemisphere, 465 grammes. Left hemisphere, 185 grammes.

3. Imbecile. Eleven years. Left hemiplegia and epilepsy. Left hemisphere, 570 grammes. Right hemisphere, 310 grammes, showing pachymeningitis and meningo-encephalitis.

4. Idiot. Four and a half years. Right hemisphere, 460 grammes. Left hemisphere, 200 grammes, with marked sclerosis.

5. Imbecile. Thirteen years. Right hemiplegia. Right hemisphere, 665 grammes. Left hemisphere, 455 grammes.

6. Idiot. Ten years. Right hemisphere, 477 grammes. Left hemisphere, 255 grammes.

* Bourneville, *Progrès Médical*, 1898, p. 248.

SCLEROTIC AMENTIA.

It has already been remarked that sclerosis, due to proliferation of neuroglia, is found post-mortem in a considerable number of cases of both the primary and secondary forms of amentia.* In many of these it is a pathological condition which has no clinical significance, and it gives rise to no definite symptoms by which its presence may be diagnosed, or even suspected, during life. In a small proportion of cases, however, the neurogliosis attains such magnitude as to produce a tolerably readily recognizable type of amentia, and this we shall here describe.

Regarding the etiology of these cases our knowledge is very imperfect, and it is probable that a similar result may be produced by different causes. In many—indeed, I think, in the majority of cases—inquiries into the family history reveal the presence of alcoholism, phthisis, insane and epileptic heredity, precisely the same as in ordinary cases of primary amentia; but in addition there is often a history of birth injury or other vascular or toxic lesion of early infancy which may possibly act as a determining factor; whilst in a few cases the latter conditions alone are present. But although it seems probable that in the majority of cases sclerosis is determined by, and is the after-effect of, some diseased (vascular or toxic) condition of the brain, there is no doubt that in a small number of instances it may arise independently of such conditions, and it is then to be regarded as a developmental anomaly complicating primary amentia. But whether the amentia be a primary one complicated by sclerosis, or whether the sclerosis is itself the cause of the amentia, the result is pretty much the same and since the special clinical symptoms in these cases are in the main referable to the sclerosis, and since, moreover, the cases resemble many of the pure secondary forms in their tendency to degeneration and dementia, it seems, on the whole, preferable to describe sclerotic amentia in this place.

There are two chief types of sclerosis, dependent upon whether the proliferation of neuroglia is generally *diffused* throughout the cortex, or occurs in *circumscribed* patches. This division, perhaps, is not an absolute one, for cases occur in which both a diffuse and circumscribed gliosis exist, and cases of diffuse sclerosis have been

* See Chapter IV., Pathology, p. 79.

described which were localized to one hemisphere. On the whole, however, the majority of cases conform to one or other type, and these types are accompanied by different clinical symptoms. Briefly, it may be said that in cases of *diffuse* sclerosis the dominating symptoms are general muscular weakness, often accompanied by spastic rigidity and feeble contractures, but rarely by actual paralysis. There is also marked tremor, but not often definite convulsions. In *localized*, *nodular*, or *tuberous* sclerosis, on the other hand, there are usually frequent epileptic fits without paralysis or contractures, although movements are often tottering and tremulous, and in these latter cases death often results from a succession of fits.

Diffuse Sclerosis.

Rapidly increasing gliosis produces an enlargement of the brain, and in this way gives rise to a clinical variety of amentia which is known as "hypertrophic." With the lapse of time, however, the neuroglia tends to contract, and there is then produced a regular or irregular form of brain atrophy. The hypertrophic brain never tends to indefinite enlargement as does the hydrocephalic, and contraction is only a question of time. This contraction of the glia tissue is well seen in the central umbilication which takes place in the tuberous areas of the localized form; it may also be observed in other diseases; for instance, the spinal cord in the early stage of extensive disseminated sclerosis is greatly swollen, whilst in the later stages it becomes exceedingly small, shrivelled, and distorted.

Dependent upon whether cranial enlargement is or is not a prominent feature we may divide cases of diffuse sclerosis into two groups—namely, *atrophic* and *hypertrophic* forms. But, as already stated, it is doubtful whether there is any essential pathological difference between these two forms, and the clinical difference is probably dependent upon the extent and rapidity with which neuroglial increase takes place whilst the cranial bones are yet ununited. Where synostosis has not occurred, so that expansion of the skull may allow of cerebral enlargement, the prognosis as to life and response to training is much more favourable than where the bones offer an unyielding resistance.

(*a*) **Atrophic Form.**—These cases are very rare. In those hitherto recorded the mental deficiency has usually been of a pronounced

grade, and although there may be some slight response to training at first, progressive dementia supervenes sooner or later. Definite convulsions are uncommon, but a condition of muscular tremor is always present. This varies from a more or less constant shaking of the head to an incessantly repeated fine tremor of the whole body. It is increased under observation or voluntary effort, and is often described as chorea; but it is more akin to the tremor of paralysis agitans. In addition there is a general muscular weakness, with spasm and incomplete contractures of the arms or legs, but there is rarely actual paralysis. The reflexes are increased. In some cases both epileptic convulsions and paralysis are present, and Bourneville* has described a case in which these were at first limited to one side of the body; but at the age of thirteen classic epilepsy appeared, and the patient died, aged twenty-one, in status epilepticus. The post-mortem examination showed atrophy and sclerosis of the whole of one hemisphere.

Illustrative Cases.

Diffuse Sclerotic Amentia with Progressive Dementia.†—*E. G.*, female, was admitted to Darenth Asylum at the age of twelve years. No history obtainable. Her mental status was that of an imbecile, but sight and hearing were good, and she possessed a good memory for faces. Speech was very scanty, and was slow and hesitating. Habits cleanly. She was described as a cripple, but not paralyzed. There was general muscular weakness of all the limbs, so that she was unable to wash, dress, feed, or do anything for herself. In addition there was a slight shaking movement of the head. She spent all her time sitting in a chair, but she noticed what went on round her. The cranial circumference was 19½ inches.

After a time the shaking movements of the head increased, and eventually extended to all the limbs. There were, however, never any definite convulsions. The muscular helplessness also increased, and the arms and legs became slightly contracted at the elbows and knees respectively. She became duller mentally, less observant, and wet and dirty in her habits. Finally her temperature

* Bourneville, "Sclérose Cérébrale Hémisphérique," *Archives de Neurologie*, 1897, vol. iii.

† For the clinical notes of this case I am indebted to Dr. F. R. P. Taylor, formerly Medical Superintendent of Darenth Asylum.

suddenly ran up to 104° F., and her pulse to 180, and she gradually sank and died without any signs of disease other than the cerebral sclerosis. Her age at death was twenty years.

Post-mortem examination failed to reveal disease of any organ other than the brain. The dura mater was thick and congested; the piâ thick and opaque, but non-adherent. The whole brain was small, but heavy for its size, weighing 32 ounces. Its consistence was extremely dense—in fact, almost like cartilage. Upon making a microscopical examination I found that the whole of the hemispheres, the white as well as the grey matter, were the site of a dense diffuse sclerosis; the cerebellum was similarly involved.

The following very similar case is described by Dr. O. Heubner:*

The patient, a boy of five years, seemed bodily and mentally sound until the age of three and a half years, except that he was late in learning to speak, and could not talk fluently. The family was said to be healthy. Apparently as the result of, or at any rate after, a fall on the back of the head, he no longer played willingly, and was often apathetic. Nine months afterwards appeared a slothfulness of all movement, and his walk became staggering. This was followed by spastic paralysis of the legs, with contractures at the hips and knees, and double equino-varus. Strong intention tremors then appeared in the arms, also followed by spastic paralysis. There was difficulty in swallowing, so that he could only take liquids, and eventually he became unable to speak. There was constant movement of the head and upper extremities, and there was slight paresis of the lower part of the right face. He became progressively weaker in mind, but able to recognize people he knew, and there was no observable alteration in general or special sensation. The knee-jerks were increased, electrical reactions normal, and there was incontinence of urine and fæces. He became much emaciated, and died of bronchopneumonia. Post-mortem examination revealed a pale yellow brain of unusual hardness throughout, the white and grey substances, as well as the cerebellum, being extensively involved by sclerosis.

The two following cases of brother and sister, who were kindly shown to me at Darenth Asylum by Dr. F. R. P. Taylor, are probably examples of diffuse cerebral sclerosis.

The mother of these patients is healthy, but the father is insane

* O. Heubner, "Ueber diffuse Hirnsklerose," *Charité-annalen*, 1897, xxii.

in an asylum. The father and mother are first cousins; the mother's father and mother were also first cousins. There have been fourteen children born in the family—five are dead and nine living; there is "something the matter with all of them," and at least one other is mentally defective.

Rose, the elder patient, was born prematurely at the seventh month, and she has been abnormal from birth. She commenced to say a few words when about two years of age, and made attempts to walk at three; but she never made much progress, and at the age of twelve years, on account of the mental deficiency and constant tremor, she was sent to the asylum. She proved uneducable, and the tremor steadily became worse. When I saw her at the age of twenty-one years she was a bright-looking girl, apparently quite happy and contented, but of markedly limited mental power. She understood a good deal of what was said to her, and made attempts to reply; but her articulation was quite unintelligible on account of the tremor. She spent the day sitting in a chair, and was quite unable to walk, or even stand, without support. There was spastic rigidity, with inversion and adduction of both legs and feet; the knee-jerks and plantar reflexes were exaggerated, and ankle clonus was well marked. The head was never still in consequence of constant rhythmic up-and-down and side-to-side movements; the facial muscles were also affected, giving rise to a never-ending series of extraordinary grimaces. These movements were described as chorea, but they really had greater resemblance to paralysis agitans. They were worse under observation, but ceased during sleep.

The brother, William, was very similar, except that in his case the rhythmic movements affected the whole body—head, face, arms, hands, and legs. It was impossible for him to pick anything up, or to retain anything in his hands, but the grasp of the hands showed that tolerable muscular strength was present. He understood what was said to him, and attempted to reply, but his words were quite unintelligible. He had a moderate amount of intelligence, and obviously observed what was going on round him, and he was quite clean in his habits.

(*b*) **Hypertrophic Form.**—This condition is sometimes described as *hypertrophy of the brain*, but it is to be borne in mind that the hypertrophy concerns the interstitial tissue only, and not the cerebral neurones—that it is, in fact, a (probably diffuse) gliosis.

Hypertrophic amentia is relatively rare, and is characterized by an enlargement of the brain and skull and by certain bodily and mental symptoms. The largest skull of this variety I have seen had a circumference of 25 inches. Owing, however, to an increase in the density as well as the size, the brain weight is often considerably greater than would be expected even from the size of the skull. Dr. Fletcher Beach found the brain of a boy who died at the age of fifteen to weigh 62 ounces (1,755 grammes). Dr. Ireland quotes two cases described by Dr. Daniel Brunet. The brain of one, at the age of seventeen, weighed 1,632 grammes; that of the other, dying at the age of eighteen, weighed 1,780 grammes.

Owing to the cranial enlargement, these cases are sometimes mistaken for hydrocephalus; but, as pointed out by Dr. Fletcher Beach, there are readily recognizable differences. The skull of the hypertrophic ament tends to be square in shape instead of round, and there are sometimes well-marked frontal prominences. In hypertrophy, the greatest circumference is at the level of the superciliary ridges, whereas in hydrocephalus it is greatest over the temples. Thus, although the skull of the hypertrophic patient looks massive, it has not that "top-heavy" appearance so characteristic of the hydrocephalic. Further, in hydrocephalus there is usually bulging of the fontanelle and sutures, whilst in hypertrophy this is not generally the case; in fact, the expansile effects and the tendency to distend the skull seem to be much greater in the former than in the latter condition. The cranium, having reached a certain limit, ceases to further expand, in consequence of the contraction of the neuroglia; whilst hydrocephalus tends to expand the skull indefinitely.

Hypertrophic amentia is usually accompanied by headache, which may be very severe, and by epileptic fits. In some cases the fits diminish in frequency and severity, and they may entirely cease. In others they get steadily worse, and many patients ultimately die of exhaustion following a series of fits. In a considerable number there is a general muscular weakness of all parts of the body, so that the balance is unsteady, the walk slow and tottering, and the grasp feeble. Tremor is often brought on by exertion. In consequence, manual work is performed slowly, clumsily, and with considerable difficulty. Speech is often similarly affected. Most of the cases I have seen have been somewhat

undersized, heavy-looking and of good bodily nutrition, also of cheerful although somewhat simple expression.

The degree of mental defect varies very much, and seems to be dependent upon the frequency with which convulsions occur. Where these are slight, it is usually one of mild imbecility, or even merely feeble-mindedness; but if the fits are at all frequent, a condition amounting to idiocy may be present. Attacks of rage and violence have been described, but these are by no means constant, and I doubt whether they are any more common in this than in other varieties of amentia. Certainly some of these persons are harmless and thoroughly good-tempered. The severe cases, which are accompanied by frequent fits, seem to die early, and, as far as one can judge from the cases which have been recorded, few survive long after maturity. This, however, is by no means so with the milder forms, in whom fits are comparatively rare, and at the present time there is one of these patients in Earlswood Asylum who is fifty-two years of age, and seemingly in excellent health.

Illustrative Cases.

W. C. T., male; the only child; no morbid heredity. He seemed in every way normal until three years of age, when he had an acute illness, which the mother calls "influenza and rheumatic fever." It was accompanied by fever and very great pain in the head. He went to school at the age of seven, and left at fifteen. Was in the fourth standard, but his mother admits that he was very dull at learning, and does not think he was equal to fourth-standard work. He had whooping-cough at the age of nine, which was accompanied by six fits. There were no further fits until twelve years of age, but during this time he was noticed to be very unsteady in standing and walking, and he would frequently fall down both in and out of school. In addition to being somewhat dull, he was prone to outbreaks of bad temper and irritability, and was at times spiteful. The head was first noticed to be larger than usual after the attack of whooping-cough at nine years.

I first saw him when he was fifteen years of age. He was undersized, but fat and heavy. The circumference of the skull at the level of the supra-orbital ridges was 23 inches; there was no asymmetry and no prominences; the fontanelles were closed. The upper and lower jaw-bones were also larger than usual, and as a

result there were large gaps between the teeth. The teeth themselves were poorly developed, and many were decayed. The palate was broad and shallow. The nose was strikingly broad, with prominent fleshy nostrils; the lips were thick and fleshy, and the mouth large. The tongue appeared quite normal, but was always protruded markedly to the right side. There was nothing abnormal about ears or eyes. The external genitals were well developed, and there was an abundance of pubic hair. There was considerable rigidity of the hands, arms, and legs. No actual paralysis was present, but the left hand, arm, and leg were definitely weaker than the right, and he walked with a well-marked limp. The knee-jerks could not be obtained, but both plantar reflexes were exaggerated, particularly the left. Whilst under examination there were almost constant irregular jerky movements resembling chorea; these also were most marked on the left side. He was subject to tonic convulsions averaging four or five daily. During these the right eye was firmly closed and the face drawn to the right, the left eye being open. Legs and arms were rigid and drawn up on to the trunk. No clonic movements and no loss of consciousness. There were no sensory defects, memory was good, attention rather fitful. He understood all that was said to him, and could converse quite rationally, although his speech was thick, slow, and hesitating. He used to stutter a great deal, but not now. He could read and write, but was exceedingly poor at sums. He had considerable moral and religious sense, and was obedient and well-behaved. His mental status was one of mild feeble-mindedness.

He is now twenty-one years of age, and has been under my observation for six years. At the present time the cranial circumference over the supra-orbital ridges is $23\frac{5}{8}$ inches, over the brow $23\frac{3}{8}$ inches. His height is 5 feet, weight 9 stones, and there is practically no alteration in his appearance. There have been no convulsions for several years, but if he gets upset or excited the hands and arms become rigid and are drawn up on to the chest. His walk is slow and somewhat tottering, and his balance is unsteady; but if he is allowed to take his time, he can walk several miles. He can do odd jobs, and can clean a pair of boots, but it takes him an hour to do so. If he is hurried a general muscular tremor sets in, which makes work impossible. His hand-grasps are fairly good; the legs are spastic. He frequently complains of

SECONDARY AMENTIA DUE TO SCLEROSIS.

FIG. 45.—A case of so-called "hypertrophy of the brain." Age, 21 years.

FIG. 46.—Hydrocephalic and microcep[illegible] imbeciles.

To face page 254.]

headache, which he refers to the parietal eminences. There is a decided improvement in his mental condition, and he can do many small jobs about the house. He can carry a parcel or a message, but his mother says that he cannot be trusted to do shopping, as he gets into a hopeless muddle with the change. His temper is irritable and perverse at times, but on the whole he is obedient and gives no trouble. I have got him into several situations, but he has been discharged from each in turn in consequence of his general incompetence.*

It is worthy of note that the increased size of the jaws, with the separation of the teeth and the large and broad nostrils, give rise to a physiognomy somewhat resembling acromegaly. There are, however, no other signs of that condition, and the early onset is totally unlike it. It is quite possible, however, that the signs which are present may be due to a partial sclerosis of the pituitary gland.

I have quoted this case somewhat in detail because it seems to me to be a very typical example of that form of hypertrophic amentia in which fits have not produced serious mental degradation. At the present time there is a very similar case in Earlswood Asylum, and another patient of this type whom I have known for over ten years has managed during that time to earn his keep as a tradesman's boy. In this case, however, the amentia is less marked, and his employer has treated him with considerable indulgence.

Tuberous or Nodular Sclerosis.

In this form of sclerosis the overgrowth of neuroglia occurs as circumscribed nodules varying in size from a pea to a walnut. These are found in the cortex of the cerebral hemispheres, where they form hard pale masses, which frequently project slightly above the rest of the brain, and are usually marked by a central umbilication due to contraction. They also occur as protuberances projecting into the lateral ventricles, and in one case examined by myself there was in addition a dense cap of sclerotic tissue immediately beneath the piâ-arachnoid over several regions of the cortex. This latter may possibly represent an earlier stage of the cortical infiltration. Bourneville of Paris was the first to draw attention to this form of sclerosis, and although a considerable number of cases have since been described by other authors, it mu t be looked

* This patient's condition is practically unchanged five years later, and during this time there have been no convulsions.

upon as decidedly uncommon. During the last few years the condition has attracted much interest owing to the discovery in several of these patients after death of tumours in the kidneys, heart, and other organs; also by the fact that a certain proportion of them have suffered from that curious papular growth in the skin known as "adenoma sebaceum," which has been described on p. 146. Thus Fowler and Dickson,* who have analyzed the records of twenty-six cases, find that renal tumours were present in seventeen, being usually bilateral and generally described as "cancerous"; heart tumours (rhabdomyomata) were mentioned as occurring in four cases; tumours of the thyroid, thymus, duodenum, and spleen being also reported; whilst adenoma sebaceum was present in thirteen out of the twenty-six cases.

The association in some cases of the nodules in the brain with the kidney tumours and skin lesions, led Vogt,† and subsequently other authors, to regard the combination as a distinct clinical entity, and Dr. E. B. Sherlock‡ has proposed for it the name of "epiloia." But it is extremely doubtful if this association is sufficiently constant to warrant such a view. Whether the kidney tumours have ever been present without the cerebral sclerosis I do not know, since such cases would be unlikely to come under the observation of the psychiatrist; but Dr. R. Langdon Down tells me that he has made a post-mortem upon a patient who suffered from adenoma sebaceum in which there was no sign of either sclerosis of the brain or kidney tumours; and Crocker describes two cases of adenoma in which there were certainly no indications of the brain lesions, one in a clever boy of eleven, and another in an intelligent woman of forty-eight. Out of the nine cases of "epiloia" described by Dr. E. B. Sherlock, there are three in which fits are absent (or not stated), so that there is no reason to suspect the presence of cerebral sclerosis; whilst adenoma only appears to be at all marked in three, to be not pronounced in three, and to be absent (or not stated) in three cases. On the other hand, it is an undoubted fact that the typical brain lesions have been found in many patients without either the kidney tumours or the adenoma, and such cases have been described by Bourneville, Bonfigli, and myself. On the whole, therefore, since the name of "nodular" or "tuber-

* J. S. Fowler and W. E. C. Dickson, *Lancet*, May 14, 1910, p. 1351.
† H. Vogt, *Monatsschr. für Psych. und Neurolog.*, Band xxiv., 1908.
‡ E. B. Sherlock, "The Feeble-minded," 1911.

ous" sclerosis is now sanctioned by many years' usage, and describes a condition about which there is no doubt, it would perhaps be wiser to postpone the coining of a new name until we are quite sure that the condition to which it is applied really exists.

In most cases of tuberous sclerosis there is a well-marked neuropathic family history, and this, with the usually early onset of the symptoms and the absence of any external determining factor, rather suggests that the disease is a developmental anomaly complicating imperfect neuronic growth. If this were so, it would fall into the group of primary amentia; but in view of the pronounced nature of the cerebral lesions I have provisionally included it in this place. It may be mentioned that the application of the Wassermann reaction by Gordon* to seven cases gave a positive result in one.

Convulsions are usually the first symptom to attract attention, being noticed in most instances towards the end of the first year. In a few cases, however, they are preceded by irregular muscular twitching or head-nodding. They continue during the life of the patient with tolerable frequency, in some cases occurring daily, in others at intervals of a few days. They are indistinguishable from ordinary idiopathic epilepsy, although minor attacks often occur as well. Mental impairment is noticed in the early years of life, and varies from a condition of mild imbecility permitting of some training, to a more pronounced imbecility or idiocy; usually it is of a severe grade. Headache is often present, also muscular tremor, and the balance may be unsteady and the gait tottering; but definite rigidity and contractures, like those met with in the diffuse variety, are absent. There are no sensory disturbances. Progressive dementia supervenes, and death usually takes place in status epilepticus before the age of maturity. In some patients it results from pneumonia.

It occasionally happens that in patients presenting these symptoms kidney tumours can be palpated during life, or there may be urinary changes in the shape of dropsy or uræmia. The diagnosis of nodular sclerosis may then be made with tolerable certainty; but in other instances it must be dependent upon the presence of the fits, associated with twitching, head-nodding, and tremor, an unsteady and tottering gait, headache, and progressive mental impairment.

* J. L. Gordon, *Lancet*, September 20, 1913, p. 861.

Illustrative Cases.

W. S., male. Father insane; father's mother epileptic and insane. The patient has been subject to epileptic fits since a year old. He has always been of deficient intellect, and was unable to learn at school. He was subject to attacks of excitement and violence, and, according to his mother, would take up a knife to anyone on the slightest provocation. At the age of thirteen he became so troublesome that he had to be sent to the asylum. On admission he was found to be a pronounced imbecile, possessing numerous stigmata of degeneracy. He understood what was said to him, and was able to converse, but in a very simple and childish manner. He had a great fancy for drawing, but no ability. He was subject to frequent epileptic fits and occasional paroxysms of excitement. There was no paralysis. His memory gradually became defective and his articulation indistinct. Salivation was constant. He became more and more demented, and died at the age of nineteen from exhaustion consequent upon status epilepticus lasting seven days. During this time he had 406 convulsions.

Post-Mortem Appearances.—The *skull* was symmetrical and the bone very dense, but not thicker than normal. The *dura mater* and *pia-arachnoid membranes* were natural, the latter stripping with undue readiness from the sclerotic portions of brain described below. There was no excess of cerebro-spinal fluid.

Brain.—The weight (including pons and cerebellum) was 1,445 grammes, representing a considerable increase relative to the size of the organ; the two hemispheres were of equal weight. On stripping off the pia-arachnoid it was seen that several convolutions of both hemispheres were smoother, paler, protuberant, and much more compact in appearance than the rest of the brain, and from these the membrane stripped with great readiness, although clinging to the other regions in a natural manner. The hardest of these protuberances were marked by a central umbilication. On making a section into these convolutions they were found to be extremely firm and dense owing to portions of the brain substance being replaced by sclerotic tissue. These sclerotic areas were abundant in both hemispheres, being chiefly confined to the superficial grey matter; they were somewhat irregular in outline, and tended to pass gradually into the adjacent brain tissue. In the portions involved the cortical striæ were very irregular and much obscured;

but on the whole the condition was one more readily appreciable by the sense of touch than that of sight, the extreme hardness of the areas being their most characteristic quality.

Attached by a broad base to the corpora striata, and projecting inwards therefrom into the cavity of the lateral ventricles, were numerous small nodules varying in size from that of a grape-stone to a large pea, and consisting of a very dense tissue similar to that in the brain. On section these nodules could be seen with the naked eye to slightly infiltrate the adjacent portion of the grey matter from which they grew. The lateral ventricles were not dilated and the ependyma was normal.

Cerebellum.—There was obvious naked-eye atrophy of several leaflets on the upper surface of both hemispheres, chiefly confined to the lobus clivi. The *medulla* and *spinal cord* showed no naked-eye change. Broncho-pneumonia was present, but no tumours of skin, kidneys, or other organs.

Microscopical Examination.—Sections were examined from several regions of the brain, medulla, cerebellum, and spinal cord.

Brain.—The dense areas described above are seen to consist largely of glia tissue. In some of them the glia cells are comparatively few and of a fully formed appearance, there being present an abundant meshwork of fibres; in other areas, however, the cells are much more numerous and of more recent formation, and the sclerosis is not so dense. The areas are not sharply defined, but pass insensibly into the surrounding brain tissue, and they are comparatively poorly supplied with bloodvessels. The nerve cells of the cortex are very irregularly arranged, their apical processes pointing in all directions. In addition, a large number of them have the ordinary appearance of imperfectly developed cells, and a considerable number of actual neuroblasts are also present in the superficial layers. A large number of the cells, especially the smaller and medium-sized pyramids, are also undergoing a chronic form of degeneration, being small and withered-looking, the nuclear membrane often indistinct, the processes few and attenuated, and the cell body containing a considerable collection of pigment. In the region of the sclerotic areas the lamination is very irregular, probably largely the result of the neuroglial overgrowth. In some of the convolutions there is a dense band of neuroglia on the surface of the brain immediately underneath the piâ-arachnoid membrane, and superficial to the tangential fibres. The nodules projecting

from the corpora striata consist of almost pure glia tissue, the cells of which have a peculiar whorl-like arrangement. They are covered by an ependyma of perfectly normal structure. Sections stained by Marchi's method reveal the absence of any recent degeneration amongst the medullated fibres of the white matter. The tangential, super- and inter-radial fibres, as well as those composing the outer line of Baillarger, are considerably diminished in number in all parts of the brain. There are two or three small foci, situated within the sclerotic areas, in which granules of hæmatoidin occur, apparently indicating an old hæmorrhage; the endothelial cells of some of the capillaries contain collections of black pigment (Marchi sections), but otherwise there is no structural alteration in the vessels of either the brain or membranes, and no evidence of any inflammatory change.

Cerebellum.—Sections of the atrophied portions show that there is marked diminution in the number of Purkinje's cells and also in the projection fibres; but Purkinje's cells do not contain any pigment like that in the cells of the brain.

Medulla and Cord.—There is slight interstitial sclerosis (no Marchi change) in the crossed pyramidal tracts traceable as far as the mid-dorsal region; also in the antero-lateral columns as far down as the fourth cervical segment. The cells of the anterior horns are plentiful and well formed, many of them contain a considerable collection of pigment which stains black with Marchi's stain, but otherwise they appear to be normal. There is no sign of any diffuse sclerosis in the cord like that met with in the brain.*

A case presenting identical histological features with the above was described by Dr. Joseph Sailer.† In this there was an insane and alcoholic heredity, and spasms began at the age of ten months. The mental condition was one of low-grade idiocy. Epileptic convulsions were frequent, and the patient died, aged fifteen, of exhaustion after a succession of fits. In this case there was a huge tumour-like mass in the right kidney, and smaller growths in the left.

The two cases described by Bonfigli,‡ epileptic imbeciles of seven

* This case was reported by the author in "Archives of Neurology," vol. ii., 1903, p. 402.

† J. Sailer, "Hypertrophic Nodular Gliosis," *American Journal of Nervous and Mental Disease*, 1898, p. 402.

‡ R. Bonfigli, "Über tuberöse Sklerose," *Monatsschr. f. Psych. u. Neurolog.*, Band xxvii., May, 1910.

and five years respectively, presented similar histological appearances. Another similar case was described by Dr. Margaret B. Dobson.* In this there was a marked family history of tuberculosis, alcoholism, and epilepsy, and the patient, a male epileptic idiot, died at the age of ten years from pneumonia accelerated by exhaustion from epilepsy.

The earliest symptom noticed was "twitching of the face and nodding of the head" when he was three or four weeks old. Convulsions resembling those of idiopathic epilepsy commenced one year after birth. When admitted to the asylum, at the age of five years, he was described as being a low-grade idiot, unable to do anything for himself, quite incapable of answering the simplest questions, but made inarticulate noises; wet and dirty in his habits. His gait was peculiar in that he had a tendency to walk on his toes, and seemed incapable of walking in a straight line. He would rotate round any fixed object on the floor in a direction from right to left. He had both grand mal and petit mal, and had an average of two to six fits per day. He suffered from adenoma sebaceum. Dr. Dobson gives a very good account of the naked-eye and microscopical appearances of the brain (illustrated by four photographs), and from this it is clear that the case was pathologically identical with that of my own just described. With the exception of red hepatization of the lungs, the body organs showed no changes of interest.

Drs. Fowler and Dickson† describe the case of a female child who was admitted into hospital, at the age of one year, suffering from convulsions. She had previously appeared normal. On admission she was semiconscious and suffering from clonic spasm on the left side of the face. The limbs were flaccid, the knee-jerks were active, Kernig's sign was absent, and the pupils were equal with left internal strabismus. She died a month afterwards of empyema. Post-mortem examination showed tuberous sclerosis of the brain with rhabdomyoma of the heart, but no changes in the skin, kidneys, or other organs. The immediate cause of death was broncho-pneumonia, empyema, and collapse of lung.

* Margaret B. Dobson, *Lancet*, December 8, 1906, p. 1583.
† *Op. cit.*

HYDROCEPHALIC AMENTIA.

Primary amentia may be complicated by hydrocephalus, and this condition is even occasionally found in making post-mortem examinations of microcephalics. The term "hydrocephalic amentia," however, is better restricted to those cases in which the mental deficiency is secondary to this lesion.

As to the cause of hydrocephalus much uncertainty exists. Some cases are the after-effect of chronic meningitis or tumours (usually syphilitic or tubercular) of the base of the brain; in others no antecedent lesion can be discovered. However produced, the essential condition consists of an accumulation of cerebro-spinal fluid, which may amount to several pints, within the ventricles of the brain. In consequence of the pressure of this fluid, the brain tissue adjacent to the ventricles is gradually thinned and destroyed. In extreme cases it may be reduced to a mere shell but a fraction of an inch in thickness, so that the hemispheres resemble a huge cyst. The parts least affected are the cerebellum and basal ganglia.

The expansile force of the fluid is usually marked upon the skull, the bones of which become widely separated; and this, with the general enlargement, produces a clinical picture which cannot well be mistaken. But in some instances hydrocephalus may exist with a small skull, owing to premature ossification of the cranial bones, and the condition will then only be revealed after death. Such are usually pronounced idiots; convulsions are frequent, and death takes place early.

Occasionally hydrocephalus exists before birth, but if at all severe it is rarely possible for the child to be born alive; and in the majority of cases met with the onset takes place in the first few months, or it may be years, of life. There can be no doubt that a great proportion of children so affected die within a few years. In other cases a spontaneous cure takes place, and it has even been affirmed by Edinger that a mild hydrocephalus occurring in childhood, which becomes cured, may actually favour mental development owing to the distension of the skull cavity causing a lessened resistance to the growth of the brain. In most cases, however, there results some degree of mental deficiency.

The subsequent course varies, and in the main there are two

SECONDARY AMENTIA DUE TO HYDROCEPHALUS.

FIG. 47.—Male hydrocephalic. Age, 1¼ years.
(From a photograph lent by Dr. J. Thomson.)

MICROCEPHALIC AMENTIA.

FIG. 48.—Female microcephalic. Age, 4½ months.
(From a photograph lent by Dr. J. Thomson.)

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types. In one, whilst the patient may be imbecile, or even idiotic the mental condition is of secondary importance, in view of the active and steadily progressive nature of the disease to which it is due. Such children are acutely ill, the body is wasted, convulsions are frequent, and severe paralysis is generally present. Many of them are bedridden. They may be blind or deaf from the pressure of fluid, and optic atrophy is often seen. Although the alienist may be consulted with regard to these cases, their place is the hospital ward, and not the special institution, and death soon closes the scene. In some instances considerable amelioration of the mental symptoms takes place immediately before death.

The second type, those cases usually seen in special institutions, or which come under notice on account of amentia, are those in which the hydrocephalus is either increasing very slowly or has undergone spontaneous arrest. In these cases the mental deficiency varies from a mild degree of feeble-mindedness to pronounced imbecility, and, as a rule, a moderate amount of improvement takes place as a result of special training. Dr. Ireland quotes the case of a boy under his care who lost his hearing after being several years at Larbert, and gradually lost many of the words he had learned. "He was taught a number of figurative signs, and also to spell on his fingers; and although he had the additional disadvantage of obscurity of sight—having dimness of the cornea, resulting from ophthalmia—his progress was as well marked as that of any pupil in the establishment."

The majority of hydrocephalic aments are quiet, confiding, affectionate, and obedient, and although paresis may prevent the performance of much in the way of manual work, they are usually very willing to do what they can. Owing to their muscular weakness, movements are clumsy and badly co-ordinated, and in some cases severe paralysis may be present. The legs are more frequently and more severely involved than the arms. Impairment of sight and hearing are also common; strabismus is frequent; and in the more severe cases nystagmus occurs. Epileptic convulsions are usually present in the acute stage, but tend to diminish, and often disappear altogether, in the chronic cases seen in institutions. Most patients are undersized, but there are no stigmata of degeneracy. (See Plates XVIII. and XIX., Figs. 46 and 47.)

The peculiar enlargement of the skull makes diagnosis easy. The hydrocephalic skull is uniformly increased in all directions,

and thus tends to assume a globular shape. The forehead is high and projecting, and there is usually a characteristic bulging at the root of the nose, but the greatest circumference is at the level of the temples. The fontanelle is tense, and the sutures often widely separated. In the arrested cases, however, these become filled in with Wormian bones, and the component parts of the cranium become firmly united. The scalp is thinned, and often marked by large and prominent veins. The excessive size of the cranium, in conjunction with the small face, causes the head, as seen from the front, to have a very characteristic conformation, resembling an inverted pyramid, thereby producing a curiously "top-heavy" appearance. The circumference varies from a little above the normal to as much as 30 inches or more. The average measurement of the chronic cases seen in institutions is about 25 or 26 inches, but there is no constant relationship between the size of the skull and the degree of mental impairment. The prognosis will depend upon whether the disease is stationary or slowly progressing. In the latter dementia is usually the ultimate result.

The two conditions which might be confounded with hydrocephalus are hypertrophic amentia and rickets. The distinction in regard to the former of these has already been given. In rickets the skull is often enlarged, but such is due to a thickening and increased density, and not a distension. Moreover, the rickety skull is usually asymmetrical, bossed, and ridged; the fontanelle, if still open, is depressed, and not elevated; there is an absence of the thin and prominently veined scalp, and other signs of rickets are present.

Illustrative Cases.

G. P., male, was admitted into the Littleton Home for Defective Children when six years of age. He was an orphan, and no history bearing upon his condition was obtainable. He was a delicate-looking boy of average height, with a typical hydrocephalic skull, the circumference of which was 22½ inches. The palate was high and saddle-shaped, the teeth irregular. There was left internal strabismus, also deficient power, but no definite paralysis, of the left arm and leg. He dragged both feet in walking, and the body balance was poor. He knew his letters and numbers, and could spell a few simple words, and his mental condition generally was one of mild defect. Articulation was good, and his disposition

was bright and cheerful. There was very little change for three or four months, although the boy made no headway in school. He then began to be silent and pensive, and to lose interest in his surroundings. The physical signs also increased, the legs became definitely spastic, so that walking was impossible, and all movements were performed with difficulty. By the end of six months the cranium had increased ½ inch in circumference, and, as he was becoming physically helpless and showing signs of dementia, I was compelled to discharge him.

C. H., male. The fifth born of a family of eight, two of whom are said to be in good health, although one is a heavy drinker. A third is "very delicate," and the remainder d d in infancy; one was a cripple. The father died, aged fifty-two, of bronchitis; the mother died, aged forty-seven, of general paralysis. The patient seemed all right at birth, but had a "fit" when a year old, and from that time his head was noticed to get rapidly bigger. He did not walk until late, and then very badly, and he always seemed more simple and childish than other children. He made little progress at school, and at the age of fourteen was admitted to an imbecile institution. He remained there for two years, but becoming destructive and violent, he was transferred to an asylum. He was a pronounced hydrocephalic, in poor physical condition, but clean in his habits; able to converse, and capable of helping a little in the wards. The head increased in size, and he gradually became more helpless. He is now eighteen years of age, and has been bedridden for over a year. His condition is as follows: The skull is typically hydrocephalic, and measures 25 inches in circumference. There is spastic paresis of both legs from the thighs downwards; he can just stand, but is quite unable to walk. The arms do not appear to be affected. The knee-jerks are increased, and double ankle clonus is present; also Babinsky's toe sign. On making movements a marked clonus of the legs appears, but there are no convulsions. He can hear and see, but is of decidedly defective understanding. As a rule, when questioned, he gazes at one in a stolid, helpless way, and makes no attempt to reply; when he does speak, his words are unintelligible. He pulls to pieces everything which comes into his hands, but takes practically no notice of persons or things round him. It is obvious that the disease is rapidly progressing.

J. T., male. The fourth of a family of five, of whom one died

in infancy; the others are alive and well. There is insanity on the father's side, and consumption on the mother's. The patient was born with a very big head, labour being much prolonged. He did not walk until turned four years, and has always been clumsy in his movements. He was a little backward at school, but no marked mental abnormality was noticed until the age of ten, when he began to get passionate and difficult to control. He showed a remarkable memory for ages, and his mother says that he knew the age of every one of their numerous relations.

He left school aged fourteen, and was put to bootmaking; but he never did much good, and after a short time he was taken away. He remained at home pottering about, but doing no work, until thirty-four years of age. A change then came over him; he began to wander about at night, and sometimes stayed away from home for several days together. He would put tobacco into the teapot, and do similar foolish things. He became rambling in his conversation, and said that " Jack the Ripper " had tried to cut his throat. He refused his food, saying that it had been drugged. Finally he attacked his mother with a knife, and became so maniacal that he had to be sent to an asylum.

On admission he had a typical hydrocephalic head, convergent strabismus, and slight dragging of the left leg. He was loquacious, but of decidedly feeble intellect. The maniacal condition passed off, and he became quiet and well-behaved, and he remained in this condition for several years, subject, however, to delusions that some unknown persons put poison into his food. Then the legs became weaker, so that he was unable to get about, and now, at the age of forty-five years, he is bedridden. There is well-marked spastic paraplegia, so that he is unable to walk, or even stand, without support. The arms are unaffected. The knee-jerks are increased, and Babinsky's sign is present on the right side. Both legs and feet are blue and cold. There is no diminution in tactile sensation over any part of the body, and his power of localizing touch is remarkably good. He frequently complains of a girdle sensation round the epigastrium. There is fine tremor of the hands on extension, and of the legs on attempting movement, but no convulsions of any kind. The special senses are normal. Articulation is slightly defective, but speech is coherent and rational. Memory is very good indeed. He notices all that goes on round him, and can give a very good account of his past life, but his ideas

are childish and his judgment and reasoning defective. He can read, write, and do sums remarkably well. He has lately developed incontinence. The cranial circumference is 25½ inches.

SYPHILITIC AMENTIA.

The proportion of total aments in whom a history or definite signs of syphilis exist is comparatively small; but the application of the Wassermann reaction, which has now been made by various observers (see p. 48) to a large number of mentally defective persons, leads to the conclusion that syphilis may occur to a much greater extent than was formerly thought.* In the great majority of these cases, however, other factors, generally a psychopathic inheritance, are present in addition. I shall restrict the term "syphilitic amentia" to those which appear to be directly due to the specific virus.

Whether this poison acts directly upon the cerebral neurones or indirectly upon them by interfering with their nutrition—whether, in fact, they are poisoned or starved, is a moot point. On the whole, I am inclined to think the former is the case, and that persistent antisyphilitic treatment from the very beginning of life might do much to reduce the number of these cases. Unfortunately, by the time attention is attracted to the patient's mental condition the damage has been done, and such treatment is of no avail. In persons suffering from syphilitic amentia there will usually be a history of the ordinary infantile symptoms of this disease, and the characteristic lesions—viz., keratitis, Hutchinson's teeth, scars, depressed nose, etc.—are generally found in after-life. But it seems also probable that the development of the brain may be arrested by the poison without any of these syphilitic lesions being produced, and then the diagnosis can only be inferred from the presence of a positive Wassermann reaction with the absence of any other etiological factor.

In most of these patients the body is stunted and ill-formed, the child has been backward in walking and talking (one of my cases did not speak at all until the ninth year), and some amount of mental deficiency will usually have been apparent from the first

* See a very interesting series of articles by Dr. S. A. Owen on "Syphilis of the Nervous System in Infancy, Childhood, and Early Adult Life," *Clinical Journal*, 1912; also the researches referred to in Chapter III., p. 48.

few years of life. As a rule this is of a comparatively mild degree, most of the cases being merely feeble-minded or high-grade imbeciles. They go to school, but make no progress, and upon leaving they are found incapable of following any constant employment. Occasionally the mental status is that of idiocy; but up to the age of twelve to fifteen years the syphilitic ament, beyond the presence of the typical lesions, presents no special mental peculiarities which distinguish him from an ordinary ament of similar degree.

About or shortly after the usual age of puberty, however, a considerable number of these persons undergo a remarkable change. It is noticed that the patient is becoming restless and troublesome. Hallucinations and delusions often make their appearance, and in some cases there is pronounced mania or melancholia. Soon after this the balance and gait of the body become markedly unsteady, there is considerable tremor of the hands, mouth, and tongue, and the speech becomes slurred, indistinct, and hesitating. The knee-jerks are increased, and ankle clonus is often found. Sight and hearing are impaired, and if the eyes be examined, the pupils will be seen to be dilated and to react sluggishly to light; at a later stage they become fixed. These changes are followed by a marked mental impairment, and the patient ceases to take any interest in his surroundings. There is no remission, and time only results in an aggravation of all these symptoms. The body begins to waste, swallowing becomes difficult, and the patient gets dirty in his habits. With the emaciation there is often considerable trophic disturbance, so that sores appear. Finally he becomes bedridden, gradually sinks into a comatose state, and dies. In males the external genitals retain their infantile condition, and in females menstruation does not appear. I have never noticed any grandiose ideas in these persons; but convulsive seizures are common, and these are occasionally followed by transient paralysis. The average length of time from the onset of these symptoms to the end is about five years.

It is seen that the symptoms and course of this progressive degeneration are practically identical with those of juvenile general paralysis, and this is further shown by the post-mortem appearances. In four cases which I have examined post-mortem the brain was small and simply convoluted as well as wasted, the piâ-arachnoid thickened and opaque, and the cerebro-spinal fluid in considerable

excess. There were, however, no gross syphilitic lesions. Microscopical examination showed many cells in a typical condition of incomplete development, but over and beyond this there were extensive degenerative changes indistinguishable from those occurring in general paralysis.*

I do not think that this is the termination of every case of syphilitic amentia, for I have seen a few of these patients who, at over thirty years of age, showed no mental or physical alteration apart from the original deficiency. But although I have made diligent search, these latter cases are comparatively rare, and I am inclined to think that progressive deterioration, ending in paralytic dementia, is the rule in amentia due to syphilis.

The **Diagnosis** of syphilitic amentia rests upon the presence of the typical lesions, or a positive Wassermann reaction, plus amentia, in the patient. In one of my cases the signs were indefinite, but the patient's mother had died of general paralysis. In another case a history was present, but no marks could be discovered upon the patient; a brother, however, presented the characteristic signs. Both these cases were considered to be probably syphilitic, and they subsequently developed general paralysis. Diagnosis at times, therefore, must be a matter of uncertainty. It need hardly be emphasized that all subjects of congenital syphilis do not suffer from mental deficiency; on the contrary, the proportion who become aments is probably small, and it seems likely that in most of these cases the arrest of mental development is as much a consequence of morbid heredity as of the syphilitic virus, since such heredity, or some potent predisposing cause, is present in the majority of cases. Given a child with congenital syphilis, who is at the same time the offspring of a neuropathic or degenerate stock, then I think that amentia is extremely likely to result.

It has been stated by Hirsch that all individuals suffering from juvenile general paralysis have previously been of feeble intellect. With this, however, I cannot agree, as I have known several such patients whose mental condition has been quite up to the normal prior to the onset of the degenerative changes. But juvenile general paralytics who are seen in the consulting-room or asylum in the early stages of their disease are often thought to be imbeciles,

* For one of the best accounts of the histology of juvenile general paralysis, as shown by modern methods of staining, see that by Watson in Mott's "Archives of Neurology," vol. ii., p. 621. Three at least of the twelve cases there recorded were aments.

and I have frequently known such sent to training institutions. Inquiries as to the previous mental status, with a careful examination of the patient, should readily distinguish between the two conditions.

Prognosis.—In view of the liability of these patients to develop general paralysis, it is obvious that a most guarded opinion must be given regarding the ultimate prospects of improvement from training in any case of amentia which is considered to be syphilitic. Progressive dementia does not always result, but it does certainly appear to be extremely common; and antisyphilitic treatment has been found to have not the slightest effect upon either the degeneration or the initial mental deficiency.

Several of these cases will be described under General Paralysis in the chapter on Insane Aments. The following are additional examples:

Syphilitic Amentia passing into Dementia (probably General Paralysis).—*A. A.*, male. Insane heredity on paternal side, but no history of syphilis obtainable, although the patient has several characteristic syphilitic lesions. He was noticed to be backward from birth, and did not talk until eight years old. Went to school, but could never learn, and when he left, at the age of twelve, he was only in the second standard. He had fits between six and seven years of age, which continued occasionally until fourteen years, and then ceased. No employment. Became unmanageable, and was sent to an imbecile institution when aged seventeen. Remained there for two years, but made no progress, and was transferred to an asylum. He gradually became paretic and tremulous, with small pupils, which scarcely reacted to light. At the present time (aged twenty) he is very simple, and answers questions in a slow, monotonous, and trembling manner. He cannot do the simplest sums, and does not know how many pennies there are in sixpence. There is undoubtedly considerable mental deterioration in addition to the original defect, and it is probable that general paralysis is supervening.

Syphilitic Amentia with Progressive Dementia.—*S. G.*, male. No relatives living, and no history or particulars ascertainable beyond the fact that he had lived in imbecile institutions since the age of nine years. In January, 1895, at the age of nineteen years, he became violent and unmanageable, attacked the attendants, and threatened to cut his throat; he was accordingly transferred to a lunatic asylum. On admission he was found to be an

SECONDARY AMENTIA DUE TO SYPHILIS.

FIG. 49.—Syphilitic imbecility; constantly grimacing as shown.

FIG. 50.—Syphilitic idiocy.

PLATE XX.

imbecile with aural hallucinations and mild mania. He said that voices spoke to him and told him to cut his throat. Many typical marks of congenital syphilis were present, and he had a habit of constantly keeping his mouth tightly closed in a fatuous grin, at the same time breathing noisily through his nose. (See Plate XX., Fig. 49.) He remained in practically the same condition for the next five years, at times being depressed and lachrymose, at others noisy and troublesome; he was, however, clean in habits, and was capable of doing everything for himself. In December, 1900, at the age of twenty-four years, he began to show signs of dementia, becoming stolid and indifferent to his surroundings, and frequently wet and dirty. The knee-jerks were greatly exaggerated. The dementia gradually became more marked, his gait became shuffling and unsteady, and the knee-jerks could not be obtained. During the year 1902 he began to show marked bodily enfeeblement, the dementia still continuing to progress. In February, 1904, pulmonary tuberculosis was diagnosed; it advanced with great rapidity, and he died the following month at the age of twenty-eight years. There had never been convulsions or seizures. Post-mortem examination revealed a wasted brain presenting the usual features of chronic dementia, but none of the particular signs of general paralysis. Its weight was 1,100 grammes. There was extensive tuberculosis of both lungs.

*Syphilitic Amentia passing into Dementia**—*Family History.*—The father has had syphilis; a brother of the patient also has "tremblings"; no further details obtainable.

Clinical.—The patient was always a quiet lad, and did not seem so bright as the other children. At the age of six years he began to show definite ataxic symptoms (said to have been caused by a fright), chiefly marked in the legs. There was no actual loss of power complained of, but he was only able to stand with the feet apart, and was very unsteady and apt to fall whilst walking; the knee-jerks were absent on both sides, the pupils were widely dilated, considerable tremor of the eyelids was present, and there was occasional incontinence of urine. The patient gradually became worse, eventually becoming almost completely powerless and helpless in bed, and quite demented: he died at the age of eight years.

Upon making a *microscopical examination*, I found imperfect development and irregular arrangement of the small and medium-

* For the clinical notes and the central nervous system of this case I am indebted to Dr. F. J. Smith, Physician to the London Hospital.

sized pyramidal cells of the cerebral cortex, indicating a condition of mild imbecility. In addition there was a subacute degeneration affecting a large number of these cells, and to a less extent those of the anterior horns of the spinal cord; there was also a somewhat more chronic degeneration of the cells and fibres of the pyramidal tract, and the vessel walls generally were slightly thickened. I did not see this case during life, but there are many points in both the clinical and pathological appearances which suggest that this degenerative process which was superadded to the mild amentia was analogous to, although not identical with, that of juvenile general paralysis.

AMAUROTIC FAMILY IDIOCY, OR INFANTILE CEREBRAL DEGENERATION.

This disease is invariably fatal, and its subjects rarely survive sufficiently long to become candidates for a special institution for the mentally deficient; but as it is one in which arrested cerebral development is a prominent, although incidental, feature, and on this account it might be confounded with the more ordinary forms of amentia, it is necessary to allude to it.

The earliest account we have is that given by Mr. Waren Tay in 1881, whose description chiefly referred to the peculiar ocular conditions. In 1887 Dr. B. Sachs, of New York, described the changes in the brain in a paper entitled "Arrested Cerebral Development." Other descriptions have been given by Goldzicher, Magnus, Knapp, Wadsworth, Hirschberg, Carter, Hirsch, Petersen, and Burnet. The most complete accounts are those of Kingdon and Risien Russell,* which appeared in 1897; of B. Sachs,† in 1903; and of Poynton, Parsons, and Holmes‡ in 1906; but the literature on this subject is now very extensive.

Infantile cerebral degeneration is a disease which usually attacks more than one child of the same family, and it was formerly thought to be restricted to Jews; but cases have recently been described affecting Gentiles and occurring at a much later age than those

* E. C. Kingdon and J. S. Risien Russell, "Infantile Cerebral Degeneration," Medico-Chirurgical Transactions, vol. lxxx., 1897. This paper gives a full account of the clinical and pathological conditions, together with a bibliography of the subject.

† B. Sachs, "On Amaurotic Family Idiocy," *Journal of Nervous and Mental Disease*, January, 1903.

‡ Poynton, Parsons, and Holmes, *Brain*, June, 1906.

noted by the original authors, and it seems probable that we shall have to modify the early views regarding Tay-Sachs' disease, and admit, with Vogt,* that there are two distinct forms of this affection, one of which, commencing in infants, presents the features to be immediately described; whilst the other, the juvenile form, first shows itself several years later, runs a slower course, is not characterized by the cherry-red spot in the optic disc, and is not so closely confined to the Hebrew race. Examples of this latter variety have been described by Jansky, Sachs, and others, and Karl Schaffer† gives a very full account of one such patient, a low-grade idiot, who lived to the age of twenty-four years. Turner‡ has also recently described two patients, one aged fourteen, and the other over five years. Male and female children are equally liable to be affected, but no particular exciting or predisposing factor has yet been discovered. There is no regularity in the order in which children of the same family are affected. It may be the earlier, later, or intermediate children, the rest remaining perfectly healthy. Kingdon and Russell describe the symptoms and progress of the infantile form of the disease in three stages as follows:

First Stage.—An infant, the subject of this disease, is born at the full time of gestation, and may be well formed and developed, differing in no outward respect from a healthy child, until about the completion of the third month. At this time some weakness of the muscles of the back and neck is observed, and often a suspicion that the child sees imperfectly is entertained. Should the eyes be examined with the ophthalmoscope about the fourth or fifth month, there will be found symmetrical changes in the macula lutea, consisting of a whitish-grey patch, somewhat oval in shape (the axis being horizontal), with softened edges slightly raised above the general surface of the retina. In the centre of this patch is seen the fovea centralis as a dark cherry-red spot. These changes in the maculæ remain unaltered, and are regarded as absolutely pathognomonic. At a somewhat later course of the disease there is definite optic atrophy and total amaurosis.

In the **Second Stage** the child is unable to sit up; its head falls backwards if unsupported; when lying on its back it is unable to turn over to either side. Objects placed in its hands are grasped but feebly, and soon dropped. It is generally apathetic, taking

* H. Vogt, "Über familiäre amaurotische Idiotie," *Monatsschr. f. Psychiat. u. Neurolog.*, Band xviii.

† K. Schaffer, *Archiv für Psychiat.*, Heft 1., Band xlii.

‡ J. Turner, *British Journal of Children's Diseases*, May, 1912.

no notice of surrounding objects, and the face bears an expression of mental enfeeblement. Vision is reduced to perception of light, but the sense of hearing is acute, and remains so during life, any sudden sound causing the child to start. The sense of taste is also preserved.

In the **Third Stage** atrophy of the enfeebled muscles ensues, and soon those of the whole body are involved. Emaciation progresses, and becomes most marked. The deep reflexes are exaggerated, and still later in the course of the disease rigidity of the extremities and retraction of the head become prominent features; occasional spasmodic contractions cause the child to start and cry from pain. Convulsions have been noted in one or two instances during the course of the disease, but they would appear to be an accidental accompaniment, and are, at all events, not the rule. The temperature remains normal throughout the course of the disease. The heart, lungs, and abdominal viscera are also normal.

The duration of life varies from one and a half to two and a half years, but is usually less than two years, and the disease is invariably fatal. The essential pathological lesion would appear to be a primary degeneration of the cortical neurones, the optic nerves, and the pyramidal tracts throughout their whole course in the pons, medulla, and spinal cord. The nature of the lesions and the general clinical course would suggest that the cause is some circulating toxin, but hitherto none such has been discovered, and the application of Wassermann's reaction by Poynton* failed to give a positive result, thus showing the absence of syphilis. Dr. Gordon† suggests that the origin of the disease may lie in some glandular defect or anomaly in consequence of which a profound failure of metabolism occurs; but the whole subject is still shrouded in mystery. I am disposed to think that some of the *juvenile* cases of this disease which have been described may really have been cases of general paralysis.

Section II.

AMENTIA DUE TO DEFECTIVE CEREBRAL NUTRITION.

Mental growth takes place as a result of two factors. *Firstly*, the embryonic neuroblasts must have within them a capacity for developing and acquiring certain functional connexions. *Secondly*,

* Poynton, *British Medical Journal*, May, 1909.
† Gordon, *New York Medical Journal*, lxxxv., 1907.

they must be supplied with food adequate in quantity and quality, and they must also be stimulated by impressions from without reaching them through the avenues of special sense. If either of these second essentials to growth be absent or diminished, mental development may be so interfered with that a condition of amentia results, and this is conveniently termed "amentia due to defective cerebral nutrition." Of the type which is due to quantitative or qualitative changes in the blood, cretinism is the best, as well as most common, example. The variety due to defective stimulation is known as "amentia due to isolation or sense deprivation." For reasons which I have already given on p. 96, "epileptic amentia" will also be included in this section.

EPILEPTIC AND ECLAMPSIC AMENTIA.

It used to be the custom, in describing the varieties of amentia, to group together into one class all those persons who were, or had been, subject to epileptic or similar convulsions, and to label them "epileptic" or "eclampsic" aments. A close examination of this class, however, shows that it is really a most heterogeneous collection.

It is, perhaps, not unnatural that the parents should see in convulsions the reason and cause of the mental deficiency of their child, and, as a matter of fact, there is no other single etiological factor which is so frequently advanced as the "cause." To the lay mind "fits" are both impressive and alarming. It is not surprising that even medical practitioners should frequently be satisfied with this explanation, for they are fully aware of the mental hebetude and degeneration which may supervene upon epilepsy. But I am convinced, from the examination of some hundreds of aments suffering from epilepsy, as well as from careful inquiries into their family and previous personal history, that in the great majority no such causal relationship exists as is implied by the term "epileptic amentia."

The relationship existing between epilepsy* and amentia is of three kinds, as follows:

1. *Primary Amentia in which Epilepsy occurs as a Complication.*—This has already been considered in the chapter dealing with the complications of primary amentia (p. 221).

* For convenience, the term "epilepsy" is here used to include *epileptiform* as well as *epileptic* (idiopathic) convulsions.

2. *Idiopathic Epilepsy or Eclampsia causing Amentia.*—It is with this group that the present account deals.

3. *Gross Cerebral Lesions causing Epilepsy and Amentia.*—Here both the epilepsy and amentia are symptomatic of brain lesions which have already been described in preceding pages (p. 225).

The following table shows the chief points of difference between these three groups in which amentia and epilepsy coexist:

TABLE XV.

SHOWING THE RELATION OF EPILEPSY TO AMENTIA.

	GROUP 1. *Epilepsy complicating primary amentia.*	GROUP 2. *Idiopathic epilepsy causing secondary amentia.*	GROUP 3. *Gross lesions causing epilepsy and secondary amentia.*
Morbid heredity	Pronounced	Less pronounced	Absent
Condition of patient before the fits	Some degree of amentia or general backwardness usually noticed	Normal	Normal. Onset of fits can generally be traced to some definite morbid process affecting brain
Nature of fits	Epileptic. Usually milder and less frequent than Group 2	Epileptic. Severe and frequent	Epileptic. Occasionally epileptiform; rarely constant, rhythmic tremor
Condition of patient after fits have made their appearance	Degree of amentia often much greater than would be accounted for by the severity and frequency of fits	Amentia usually mild, but much dementia	Considerable amentia may be present with mild and infrequent fits
	Paralysis may be present also if a gross lesion coexists	No paralysis	Paralysis often present
Stigmata of degeneracy	Marked (except in highest grades)	Slight	Absent
Prospects of improvement under special training	Dependent upon severity and frequency of fits, but on the whole better than in Groups 2 and 3	Practically none	Dependent upon time of occurrence, site, extent, and nature of lesion, and upon severity and frequency of fits. Usually intermediate between Groups 1 and 2

Epileptic Amentia.—I shall restrict this term to cases of secondary amentia which are caused by epilepsy. It is common knowledge that frequently repeated convulsions, or even attacks of petit mal,

may induce dementia in a person of mature cerebral development. This result, however, is not invariable, as is proved by many well-known instances to the contrary. Thus Plutarch says of Julius Cæsar: "He was of a slender make, fair, of a delicate constitution, and subject to violent headaches and epileptic fits." Mohammed was liable to frequent "swoons," which were probably epileptic in origin. Napoleon and Peter the Great were also epileptics. Nevertheless, a progressive dementia is a very frequent result of this condition. The anatomical basis of this dementia is a degeneration of the same cortical cells as are imperfectly developed in amentia.* If the development of these neurones is as yet incomplete, as in the infant, it may be irremediably arrested, and a condition of secondary mental deficiency result. For the production of amentia, then, in addition to the factors which produce dementia, the convulsions must occur during the first few years of life. This is the case in a considerable proportion of epileptics, and Sir William Gowers† states that in 12·5 per cent. of cases the convulsions make their first appearance before the age of three years. In such cases the mental development of the patient may become arrested, so that whilst his body develops his mind is no more advanced than that of an idiot, imbecile, or feeble-minded person. Sir George Savage makes the statement that epilepsy "occurring before *seven* years of age is certain to leave the patient weak-minded." Doubtless this is true, but the "weak-mindedness" is not necessarily so severe as to justify the term "mental deficiency" in the sense in which it is here used; although some degree of impairment does certainly result in most cases of epilepsy beginning thus early. The proportion of aments who owe their condition to this cause, however, and who are truly sufferers from epileptic amentia, is a small one. In my own series of cases I find that 3·5 per cent. only of aments belong to this variety, but this number must be regarded as merely an approximate estimate. The pathology of these cases has already been described in Chapter IV.; it is usually that of arrested neuronic development plus degeneration.

Epileptic aments differ considerably in their clinical features. In some the bodily condition is sufficiently unlike to be readily

* This has been shown in J. S. Bolton's exhaustive work, "Amentia and Dementia," *Journal of Mental Science*, 1905 *et seq.*

† W. R. Gowers, "Epilepsy," Clifford Allbutt's "System of Medicine," vol. vii.

distinguishable from ordinary primary aments; but there are others who resemble that class so closely that a diagnosis can only be made by most careful attention to the history and the capacity of the patient prior to the onset of the fits. It may be stated that, as a general rule, epileptic aments are better grown and developed, and possess fewer of the stigmata which are such a conspicuous feature of the primary group.

The degree of mental deficiency varies from a mild amount of feeble-mindedness to a state resembling idiocy; but this latter condition is more often the result of a superadded dementia than of a pure mental arrest. In the milder cases, although the patients rarely make much headway with school learning, a certain amount of manual training is possible, and many of them are able to do more or less useful work. But the persistence of the fits gradually strips these persons of any acquirements they may have possessed, and in the majority of cases dementia is but a question of time. On the whole, it may be said that the prospects of amelioration by training and the general prognosis of this class are of the most unfavourable description. There are a few cases of epileptic amentia in which the fits cease, and in these the mental condition may improve very considerably. There are other cases in which a diminution of the fits and some degree of mental improvement takes place, apparently in consequence of medicinal treatment and regimen; but these cases are decidedly exceptional, and in no instance is real mental deficiency, once produced, ever overcome.

There is one mental feature which is common to most of these cases, and that is, a general irritability and intractability. Epileptic aments are often exceedingly stubborn and difficult to manage; they are prone to sudden outbursts of temper and violence, and they are, in fact, probably the most untrustworthy of all the varieties of mental deficiency.

With regard to the fits themselves there is little to be said. They may be of either the minor or major variety, or of both. They are occasionally preceded by a definite aura, or by some recognizable alteration in the appearance of the patient, and they are usually followed by a varying period of intellectual, sensory, and, at times, motor exhaustion, transient paresis being by no means uncommon. In a certain number of cases they seem to be directly excited by indigestion, constipation, undue excitement, or some determinate cause; in others they occur independently of any

ascertainable factor. The frequency of some is diminished by dieting, careful regulation of the daily life, and the administration of drugs, of which the most valuable are still the bromides. In many cases, however, the fits persist in spite of all treatment, and hopeless dementia results.

Eclampsic Amentia.—Instability of the cortical cells of the brain is a normal characteristic of infancy and is probably in no small measure due to the rapid growth which takes place during this time. At the end of the first year the brain weighs three times as much as it did at birth. As a consequence there is no doubt that the child is much more predisposed to convulsions than is the adult; but although convulsions are exceedingly common in infancy, I am of opinion that no ordinary excitant will produce them in a healthy child of good heredity. Where they occur, there is either some special inherited predisposition, or else the natural instability has been markedly exaggerated by a disturbance of cerebral nutrition caused by bodily ill-health. Where this special predisposition exists, such simple exciting factors as acute indigestion, constipation, dentition, or the ordinary febrile ailments of childhood, will suffice to determine convulsions. Where no predisposition is inherited, it may be acquired in consequence of anæmia, malnutrition, chronic disturbance of the alimentary tract, and, above all, rickets.

It is thus seen that, theoretically, infantile convulsions fall into two groups—those which are the result of an inherited predisposition, and those in which the tendency is acquired. The former must be considered as undoubtedly identical with idiopathic epilepsy, and the fits often persist throughout life as ordinary epilepsy; the latter group may be termed "eclampsic." But it is not uncommon for convulsions which have been looked upon as simply eclampsic to recur, and to persist with all the features of true epilepsy; consequently the division between these two conditions is one which is exceedingly difficult, and at times impossible, to draw.*

* It is of interest to note that Dr. R. O. Moon, as a result of his examination of 200 cases of convulsions in children, says: "I have not been able to find any clear dividing-line between infantile convulsions or eclampsia on the one hand, and idiopathic epilepsy on the other. . . . On the contrary, it has seemed to me that convulsions in early life may shade off indefinitely into epilepsy or epileptiform manifestations, so that it becomes often impossible to say where the one stops and the other begins."—"Some Observations on Convulsions in Children, and their Relation to Epilepsy" (*Lancet*, September 15, 1906).

The term "eclampsic amentia," should, of course, be limited to those cases of mental deficiency which are clearly the result of simple infantile convulsions due to this *acquired* predisposition. Although this may happen, it is rare, and, in my experience, in the great majority of children who thus suffer from a series of fits which do not recur, there is no permanent impairment of the mental faculties.

Illustrative Cases.

L. J., male, the fourth born of a family of eight, of whom three only are now alive; the remaining five died in infancy, and all of them were subject to convulsions. The patient's father was strongly addicted to alcohol, and died at the age of forty-seven, cause unknown; his father's father died aged fifty-seven, and was paralyzed for six years before death. The patient's mother is alive and in tolerably good health; she had thirteen brothers and sisters, all of whom are dead, several of consumption, and her father died aged fifty, of asthma.

The patient had fits when a month old, and they have continued on and off ever since. During infancy he used to have as many as ten daily. With the exception of the fits, he was not noticed to be different to other children until schooling began. He was then found unable to make any progress, and after a short time was discharged. He remained at home pottering about, but doing no regular work, until seventeen years of age, when he became so unmanageable that he had to be sent to an asylum. On admission he was a pale-faced, somewhat undersized youth, with slight stigmata of degeneracy. He was dull of comprehension, and slow in realizing what was said to him. Memory very defective, and in replying to questions he would constantly repeat himself. Able to draw a little, but unable to read, write, or sum, and decidedly feeble-minded. He was liable to attacks of violence before the fits, and would then attack anyone who might be near him. After the fits he remained heavy and stuporose for a day or more. He admitted that he was excited before the fits, and said it came over him "all of a sudden." He complained a good deal of headache. He remained in practically the same condition, having fits at the rate of three or four weekly, and being either too excitable or too stuporose to do any work. He is now, at the age of twenty, showing signs of dementia. (See Plate XV., Fig. 39.)

F. S., female, the eighth of a family of thirteen, three of whom are dead, the remainder living, and said to be in good health. The father has been insane in an asylum. The patient had severe fits whilst cutting her teeth, and they recurred almost daily until she was five years old. Since then they have only returned at rare intervals. She always seemed idiotic, had no idea of playing like the other children, and received no education of any kind. She remained at home until in her teens, but was a great trouble, being unable to speak or look after herself in any way. She would wander aimlessly about the house, and was generally very restless; if left alone would be sure to get into trouble, and was occasionally violent and aggressive. She finally became so unmanageable that she had to be sent to an asylum.

On admission there was a state of amentia and dementia which caused her to resemble a pronounced idiot. She had no understanding of what was said to her, and was unable to articulate. She spent the day sitting in a chair rocking herself to and fro, and occasionally screaming or making a grunting noise. She had no idea of personal cleanliness, and had to be fed with a spoon. She destroyed everything she could lay her hands on. At the present time she is twenty-seven years of age, and her condition is practically unchanged. She has had a few epileptic fits at rare intervals, the longest period of intermission being four years.

To these two examples many others might be added, but they are sufficient to illustrate the unfavourable type of amentia which may result from severe epilepsy in early life. The effect, as already remarked, is not always so serious, and I know several instances in which but a mild degree of mental deficiency has been produced, and where more or less continuous occupation is possible. But I think these latter cases are exceptional. There is no doubt that the prospect of improvement is greatest where the convulsions can be relieved by treatment, and hence the importance of careful medical supervision of these cases. Into the question of treatment I do not propose to enter, since it is that of ordinary epilepsy. It may, however, be stated that attention to the diet and the ordering of the daily life are of the utmost importance, whilst of drugs the bromides will usually be found the most efficacious.

CRETINISM.

Although cretins have been recognized and remarked upon for hundreds of years (even by such ancient writers as Juvenal, Pliny, Strabo, as well as by the more modern Paracelsus), it is only comparatively recently that the cause of this condition has been at all understood. It is now established beyond doubt that cretinism is closely allied to myxœdema, and that they are both dependent upon an absence or diminished secretion of the thyroid gland.

There are two kinds of cretinism—*endemic* and *sporadic*; and although these have much in common, it is convenient, for purposes of description, to consider them separately.

Endemic Cretinism.—Endemic cretinism is a disease of wide incidence. It is most common in Europe, particularly in the mountains and valleys of Switzerland and the adjacent countries, but it also occurs in the Himalayas of India, the Andes and Rocky Mountains of America, as well as in Burmah and Madagascar. In fact, there is hardly any quarter of the globe which is free from this affection. In England cases are occasionally seen in Derbyshire and the western portion of Yorkshire. In Somersetshire it used to be fairly common, but is not now so frequently seen. In a large number of cases of the endemic form of this disease a goitre is present, but, although some diversity exists in the mental and bodily condition of the patients, the effect on the whole seems to be the result of an inadequate and not excessive secretion of the thyroid gland.

As to the cause of this thyroid anomaly [illegible] water supply, but it seems to be related in some peculiar manner to the water-supply. It is probable that the future will reveal the presence of some specific microbe or virus, but hitherto none has been isolated, although McCarrison,* in a valuable study of endemic goitre in India, adduces strong evidence in favour of its infective nature, and concludes that, although water is the chief vehicle for the organism of the disease, it is not the only one. Professor Wilms† also brings forward evidence to show that there is present which can be destroyed by heating the water, but which is not removed by filtration.

* R. McCarrison, I.M.S., *Lancet*, [illegible] 8, 1906, p. 1570.
† Wilms, *Deutsche Medizinische Wochenschr.*, March, 1910.

In consequence this condition of the thyroid a marked alteration takes place in the body and (usually) mental state of the person affected. In congenital or infantile cases the whole nutrition of the body is disturbed. There is a marked diminution in the number of red blood-corpuscles as well as in the percentage of haemoglobin. The child, whilst usually remaining fat and fatty, makes very little growth, and the majority of these persons remain dwarfs. The skin is sallow or actually yellow, dry, thickened, and wrinkled, and has the appearance of being too large for the body. The head is large and the fontanelles are late in closing. The nose is broad and flat, the lips thick and swollen, and the tongue so large that it often hangs out of the open mouth. The belly is protuberant, and the lower limbs short and bowed. The whole body is unwieldy, its balance unsteady and its gait ungainly. Puberty is often delayed, and many presumed cretins are sterile. In fact these children as a whole present bodily signs identical with those of the sporadic variety. In those cases in which the disease is acquired in later life, as a consequence of residence in a goitrous locality, changes analogous to those occurring in myxœdema are produced.

It has been stated that this condition of athyroidea may exist without any mental change, and although this may sometimes be true where the disease is acquired in later life, and also in very exceptional instances in the congenital form, there is usually produced some degree of mental deficiency. This ranges from a mild amount of feeble-mindedness to a state of gross idiocy, and is usually accompanied by deafness. This latter, however, would appear to be dependent upon the presence of vegetations blocking the Eustachian tube, and not upon any nerve change. The report of the Royal Commission of Sardinia* divides cretins into the following three classes, which, as will be seen, are practically identical with the three grades of amentia described in this book as idiocy, imbecility, and feeble-mindedness:

In Class I. the subjects have only vegetative faculties, are entirely destitute of reproductive and intellectual powers, and cannot speak. They are styled simply "cretins."

In Class II. they have vegetative and reproductive faculties and some rudiments of language. Their intellectual efforts go no

* For these extracts I am indebted to the excellent account in Dr. Ireland's work.

farther than their bodily wants, corresponding only to the impression of the senses. They are called "semi-cretins."

In Class III. there is added to the faculty of the preceding one a greater amount of intellectual power without reaching the normal human capacity. They have some aptitude at learning a trade or doing different kinds of work. They are called "cretineux," or "cretinous."

Sporadic Cretinism (Cretinoid, Myxœdematous, or Pachydermic Amentia).—This condition was first described by the late Dr. Hilton Fagge in 1871, and although since then a considerable number of cases have been reported, it is nevertheless a rare disease. Cretinoid aments do not now compose more than a fraction per cent. of all aments, and the proportion is steadily tending to diminish under modern therapy.

Although sporadic have many features in common with endemic cretins, and although in each there is a condition of athyroidea, there are some points of difference between the two. In the first place, whilst a goitre is often present in the endemic form, in the sporadic cases the thyroid gland is usually entirely absent. Secondly, although the sporadic cases may occur in regions in which goitre is prevalent, they often crop up quite apart from such a condition, and in families and localties in which goitre is unknown.

Etiology.—This raises the questions of the cause of sporadic cretinism and its relation to the endemic form. In a few of the cases coming under my own observation I found a marked neuropathic family history, just the same as in ordinary primary aments, and this led me to make further inquiries on this point. Several consulting physicians, having a considerable experience of cretins, and who were good enough to reply to my inquiries, informed me that no special neuropathic heredity had been noticed; but they added that the majority of the patients had been seen in hospital practice, and no special attention had been given to the family history. Dr. John Thomson of Edinburgh, however, had fully investigated the family history in seventeen of his patients, with the following result: In nine there was no history of nervous or mental disease or of alcoholism; of the remaining eight, in one a brother and sister were dwarfs, in four there was a family history of mental alienation, and in another of epilepsy, whilst the fathers of the remaining two patients were alcoholic.

I am greatly indebted to Dr. Thomson for his kindness in supplying me with these details, which seem to show that, although on the whole neuropathic heredity is not a marked feature of this condition, such nevertheless occurs in a proportion of cases—that it is, in fact, more prevalent in cretins than in ordinary persons. Whether in such cases the absence of the thyroid gland should be looked upon as a peculiar stigma of degeneracy complicating primary amentia, or whether it is that in these cases the athyroidea is due to the same unknown cause as in the non-hereditary cases, I am unable to say. The cause of sporadic cretinism is shrouded in so much mystery as to be at present a complete enigma, and it may be a mere chance that the neuropath as well as the non-neuropath should be affected. However this may be, it is possible that a neuropathic inheritance may be not without influence in affecting the response to thyroid treatment, which, although in many cases seemingly dependent upon the age at which it is begun, is not entirely determined thereby.

Pathology.—Whatever may be the cause of the thyroid anomaly, there is not the slightest doubt that the secretion of this gland exercises a profound influence upon the nutrition of the brain, and in most, if not all, cases of cretinism it is clearly to the absence of this secretion that the mental peculiarity is due. It is of interest in this connexion to recall the state of mental hebetude, in some cases amounting to dementia, which results in the analogous condition of myxœdema seen in adults.

The defect of this secretion does not lead to any characteristic lesion of the brain. The neurones are simply unable to develop and to perform their function because an essential constituent of their nutriment is lacking, but superadded pathological processes probably occur in cases of long standing. In several cases which have been examined after death, the cortical cells have been found in a condition of incomplete development, like that already described as occurring in primary amentia. Sometimes, in addition, the whole brain is found to be small and simply convoluted; and Scholz and Zingerle* have described the presence of hydrocephalus, various hemiatrophies and asymmetries, and areas of cortical sclerosis.

Clinical Symptoms.—The symptoms of sporadic cretinism usually make their appearance during the first year, although they are

* Scholz and Zingerle, *Zeitschr. f. Heilk.*, 1906.

rarely noticeable until the sixth or seventh month. Exceptionally they may not occur until the second or third, or even sixth or seventh year, but such cases are rare. The parents' attention is generally first attracted by the fact that the child neither grows so rapidly nor appears as bright mentally as a normal child of corresponding age; also, in the cases with early onset, that he makes no attempt to sit up, to stand, or to talk. It is commonly said that the primary dentition is considerably delayed, but Dr. Thomson doubts this, and he has been good enough to supply me with details of ten patients regarding this point, from which it appears that, in the absence of rickets, the time of dentition does not differ markedly from that of ordinary children. The anterior fontanelle is late in closing, and has been observed open in adults. Attempts at walking may not be performed until the fifth year or later. Speech may be delayed until the seventh or eighth year, and may never appear. Usually within a few years after birth the child has assumed the characteristic cretinous appearance.

The characteristic features of the fully developed condition are as follows: The body is greatly dwarfed, and many children of fifteen or sixteen years of age do not measure more than 3 feet in height. (The accompanying illustrations (Plate XXI., Figs. 51 and 52) show a cretin, aged thirty-nine, whose height is only a little over 3 feet.) The head is usually large; the legs are extremely short and bowed; the hands and feet stumpy and ill-formed. The ossification of the bones is delayed considerably beyond the normal period. The appearance of the face alone is often typical, the nose being broad and flattened, the eyes widely separated, the lips thick, the mouth partly open, and the tongue thick, coarse and protruding. In addition, the eyelids are often heavy and swollen, and the hair coarse and scanty. A very important feature is the skin, which is sallow, exceedingly dry, rough, and so redundant as to appear much too large for the stunted body. Doubtless this is the result of the under-development chiefly affecting the tissues of mesoblastic origin. The neck is usually short and thick and the belly protuberant. Umbilical hernia is common.

Puberty is usually late in appearing, and the external genitals often retain an infantile appearance until past mature age. Many of these patients are sterile. In the majority of cases the thyroid gland is completely absent, and in a considerable number of cases there are small soft swellings above the clavicles or in the axillæ.

To face page 186.]

FIG. 51.—A cretin imbecile. Age, 39 years.

FIG. 52.—The same cretin, showing relative stature.

PLATE XXI.

These are apparently fatty, and they disappear rapidly under thyroid treatment. The pulse and respiration are slow, and the temperature two or three degrees below the normal. As a result of his examination of the blood, Vaquez found that there was a marked diminution in the number of the red corpuscles, as well as their contained hæmoglobin, with an excessive number of nucleated corpuscles.

These children are often voracious eaters, but, although well nourished and even fat, most of them suffer from a general muscular weakness. This, together with their mental torpidity, causes the bodily balance to be unsteady, the gait slow and waddling, and all movements to be performed with a laboured clumsiness. These bodily peculiarities, associated as they are with their general slothfulness, apathy, and want of expression, produce a clinical picture which can rarely be mistaken.

Mentally these persons are characterized by a general impairment of all the faculties. There is often considerable defect in the power of hearing, but beyond an obtuseness of perception there is not any other marked abnormality of the special senses. Some of them are pronounced imbeciles, or even idiots, but in others the degree of mental deficiency is one of mild imbecility. Most of these milder cases can be taught to read and write simple words, to count, to do little sums in addition and subtraction, and to perform small tasks. Others, whilst capable of assisting in the domestic work of the institution, make absolutely no headway in book-learning. Most of them can be taught to be methodical and clean in their habits. As a class they are placid, harmless, good-tempered, and affectionate; and although they show little trace of emotion, they are nevertheless capable of being pleased and amused in a dull, heavy sort of way. They are amongst the least troublesome of all aments.

I know of no statistics enabling the mortality of these persons to be compared with that of ordinary aments, but my impression is that they are decidedly less frail, and not so prone to early death. Phthisis does not seem to be nearly so common. The oldest cretin I know is an imbecile man aged sixty-three years. He is looked after by his sister, who keeps a small village shop, and he is apparently in good bodily health. He has never been under thyroid treatment.

Diagnosis.—In a well-marked case of sporadic cretinism the

mental and bodily conditions are sufficiently characteristic to make the diagnosis easy. But all cases are not equally well marked, and there are some other diseases which, owing to certain points of resemblance, may be thought to be cretinism. The converse mistake, except, perhaps, in the case of rickets, is less likely to be made. The chief of these are rickets, hydrocephalus, achondroplasia, hypertrophic and Mongolian amentia.

1. *Rickets.*—It is not uncommon for early cases of cretinism to be called rickets, but the characteristic beading of the ribs and symmetrical enlargement of the epiphyses in this latter condition, with the absence of the typical cretinous facies, should suffice to distinguish between the two.

2. *Hydrocephalus.*—The only points in common are the large head, the muscular weakness, and the mental apathy. But the enlarged head of the hydrocephalic is totally different to that of the cretin, and the mental and bodily differences between these two conditions are much more pronounced than are the resemblances.

3. *Achondroplasia*, although very rare, is often called cretinism. It is distinguished by the facts that, although the child is dwarfed owing to imperfect development of the long bones, and although the skin is often dry and somewhat redundant, there is a complete absence of the swollen eyelids, the broad, squat nose, the enlarged tongue and mouth of the cretin. Moreover, the mental development is unaffected, and children suffering from achondroplasia are intelligent and vivacious.

4. *Hypertrophic Aments* resemble cretins in the large head and somewhat stunted body, and the resemblance may be intensified by the tottering gait, general muscular weakness, and mental inertia. But the facies of the hypertrophic are different: the skin lacks the dryness and redundancy of the cretin, and has not the same bogginess; there is as a rule no delay in the development of puberty, and there is not the same subnormal temperature. Moreover, the hypertrophic ament complains of head pain, and is often subject to outbreaks of temper and excitement which are totally foreign to the lethargic, inert cretin.

5. *Mongolian Aments* are frequently thought to be cretins, and were for a long time called "cretinoids." The differential diagnosis has been given on p. 220.

Treatment and its Result.—That this condition is the result of an absent or defective secretion of the thyroid gland is fully shown

by the remarkable results which follow thyroid administration. Under its influence the characteristic facies disappear, the skin becomes moist and supple, the body rapidly increases in growth, and in many cases a marked improvement takes place in the mental condition. But to obtain this favourable result the treatment must be continuous, and it must be begun at a sufficiently early age.

The effect of thyroid treatment is decidedly more uncertain and less pronounced upon the mental than the bodily development. To a great extent this appears to be dependent upon the age at which it is commenced, but there may be other factors which influence the result. Dr. G. A. Sutherland mentioned to me the case of one of his patients in whom the disease was diagnosed at the age of three months, and who after continuous treatment for six years showed no mental impairment. Dr. Robert Hutchison tells me of a case of his which has been treated from the third month, and now, at the age of fifteen years, is apparently of normal mental capacity. Dr. George Murray, of Newcastle, has also experienced such a satisfactory result. Dr. John Thomson has supplied me with particulars of a boy where treatment was begun at the age of seven and a half months, and who now, at the age of eleven and a half years, is so far improved that he reads and spells as well as the average of his age, his only noticeable weakness being in arithmetic. Another patient of Dr. Thomson's was started upon thyroid at the age of seven and a half weeks, and now, at six and a half years, is of normal appearance, somewhat above the average height, and, although not very energetic, appears to be of normal intelligence. Another case is that of a girl who has been under treatment since the age of four years eleven months. She reached the sixth standard at school, but never did much at arithmetic. She is now engaged as a compositor in a printing-office, but, owing to her slowness in lifting the type, only earns half the wage of other girls of similar age doing the same work.

It must be admitted, however, that such cases are somewhat exceptional and not the rule, and it is the general experience of those who have knowledge of these persons that the mental is rarely commensurate with the bodily development. I have in my care at the present time a patient who is an excellent illustration of this fact. He was sent to me at the age of eight years by

Dr. Soltau Fenwick, with a letter to the effect that it was a case of cretinism which had been under treatment since infancy, and had improved wonderfully in all but the mental symptoms. I could detect absolutely no bodily sign of cretinism, and, instead of the torpid mental state characteristic of that condition, he was alert and active. But the boy was a pronounced imbecile, and he has made but little improvement under special training. In this case there is marked neuropathic heredity, and the mother has been insane in an asylum. Dr. Robert Hutchison tells me of a similar case which he has treated continuously since the seventh month, and yet the child is a hopeless imbecile, although not in the least like a cretin in appearance. Perhaps these instances represent the opposite extreme, for I think it is somewhat unusual for mental improvement to be so slight where treatment is begun thus early.

In some patients improvement takes place at an even later age. Dr. Caldecott, of Earlswood Asylum, has at the present time in his care a cretin who was admitted at the age of fourteen years. She could not walk, talk, nor swallow solid food, and her mental status was that of a low-grade idiot. She had never been treated with thyroid. After three years' treatment she has grown 12 inches, can walk and run about, talks fairly distinctly, and is taking her place in school.

On the whole, I think it may be laid down that, whilst in some cases *cure* may take place if treatment be initiated not later than the third month, should the first year be allowed to pass without thyroid administration, the cretin, although improving to some extent, will seldom fully make up his mental arrears.

The most convenient method of treatment is by means of tabloids of the dried extract. Usually for a child of from three to six months a dose of ½ grain once or twice daily will be found appropriate. This must be gradually increased at the rate of 1 grain *per diem* for each year of the child's age, with a maximum of 15 grains. Treatment must be continued after the symptoms have disappeared, or a relapse will ensue; but usually an occasional large dose is sufficient to maintain the effect.

The thyroid must be given cautiously at first, and the dose increased very gradually. In some cases it causes diarrhœa, rise of temperature, and marked acceleration of the heart, apparently as a result of the increased metabolism. It should then be discontinued for a time, and again cautiously resumed. The exces-

sive growth of the long bones may cause them to bend readily, and in order to prevent serious curvatures movement must be carefully supervised.

In connexion with the subject of cretinism I may mention the following curious case of temporary cessation of mental and bodily development occurring in a girl at the age of puberty. I have never seen a similar case described, and the only explanation I can suggest is that for some reason or other the secretion of the thyroid gland was temporarily suspended. When I first saw the girl she was seventeen years of age, but in height, manner, and general development she had the appearance of a child of twelve or thirteen. Her mental condition was backward and corresponded to a similar age, and she had never menstruated. The mother informed me that the girl had seemed quite all right in mind and body until about four years previously, but since then she had been at a complete standstill. On examination the thyroid gland appeared to be normal, but the skin was sallow, coarse, dry, and had a curious boggy feel, the hair scanty, the mons veneris uncovered, the lips thick, and the teeth much decayed. There was also a pronounced flush over each cheek. She was extremely childish for her age, besides being unusually torpid in thought and movement. In view of these symptoms, I decided to try the effect of thyroid treatment. The mother noticed improvement after the first week, and after three months menstruation had appeared and a great change was evident in every way. She was under treatment for about nine months, and it was then discontinued entirely. The mental and bodily improvement initiated by the thyroid steadily continued, and when I last saw her, at the age of twenty-one years, she had a normal appearance, and was regularly employed as a clerk in the Post Office.*

NUTRITIONAL AMENTIA.

(AMENTIA DUE TO MALNUTRITION.)

In addition to the secretion of the thyroid gland, it is possible that there may be other internal secretions or particular chemical substances which are essential to the growth of the nerve cells, and the absence of which gives rise to imperfection of development and mental deficiency. As already suggested, it may be that some

* This patient remains perfectly well five years later.

such special defect is responsible for the curious combination of anomalies present in Mongolism. This, however, is mere conjecture. At present we know of no special nutritive agent other than the thyroid secretion, and the cases of amentia which we have now briefly to consider are those associated with general malnutrition.

A state of general malnutrition is by no means uncommon during intra- or early extra-uterine existence. In many cases, particularly those happening before birth, the cause is obscure. There is no hereditary defect, the mother has appeared quite well during gestation, and yet for some reason or other the child at birth is exceedingly small, feeble, and is reared with the greatest difficulty. Many of these children are the first-born, others are the last born, of a long family, and it may be that in the one the female generative organs have not attained their full physiological capacity for nourishing the ovum, whilst in the other this activity is on the wane. In some of these cases there is a very definite history of harassment, hardship, ill-health, or even serious disease whilst the mother was carrying, and then the feeble condition of the child is more intelligible. But cases occur in which none of these adverse factors have been present, and in which no cause can be found for the child's defective nutrition.

After birth, malnutrition may be dependent upon disease, insanitary surroundings, or mismanagement. Although there has been a considerable improvement in recent years, it is still unfortunately a fact that the conditions under which thousands of children are reared, particularly in our large towns, are highly inimical to development. This is sufficiently attested by the high infantile mortality rate. For instance, in his Annual Report for the year 1909, the Registrar-General says: "There is every reason for congratulation in the general improvement which has taken place in this respect, but it should be observed that while there are many urban and rural areas in England and Wales where the loss of infants under one year of age does not exceed from 8 to 10 per cent. of the total births, there are, on the other hand, many manufacturing and mining centres where the wastage of child-life is excessive, the loss in such areas in the first year of life amounting to from 15 to 20 per cent. of the total births." Now, there can be no doubt that a considerable proportion of the 80 to 85 per cent. of survivals are exposed to the same adverse surroundings, and

although they escape death, their nutrition is often so seriously impaired as to impose a great hindrance to their physical development.

What is the effect of such malnutrition upon the development of the brain? However good may be the inherent potentiality, it is clear that development cannot take place to the full in the absence of a food-supply which is adequate in quality and quantity, and consequently under such adverse conditions it is by no means uncommon to find considerable mental retardation. Such cases may simulate amentia so closely as to make a diagnosis impossible at the time, but my experience is that it is extremely rare for mental growth to be *permanently* arrested by these causes. Some embarrassment is felt for a time, but when the adverse factors are removed, the child rapidly makes up the arrears. The condition, in fact, is one of mental retardation. Exceptionally, however, it may happen for the malnutrition to be so severe, or to persist so long, that the arrears are never made up, and then we have produced some degree of mental deficiency of the secondary form. I do not think such a result is at all common, but I have now seen a number of cases in which the most searching inquiry failed to discover any other cause, and I am disposed to think that it may occur. It is perhaps not unnecessary to point out that defective nutrition may be merely the determining factor where the potentiality for development is already defective, and such cases form one variety of developmental or delayed primary amentia; also that a large number of primary aments suffer from malnutrition as a consequence of their defect. In the present place we are, of course, only concerned with that very small proportion of cases which are the direct result of malnutrition.

It is obvious that the longer the period during which nutrition is disordered, the greater will be the probability of permanent effect, and hence it follows that children who present marked signs of this at birth will be more likely to suffer from mental defect than will those who are normal when born. It is in agreement with this that nearly all the cases I have seen have been due to malnutrition during intra-uterine life. Some of the children have been born prematurely, others at full term, but all of them have been very much below the normal weight, have shown marked signs of feebleness, and have been reared with the greatest difficulty. One case of this kind which I saw recently was the only child, and was

born at the seventh month. The mother was in her usual health during gestation, but she is a delicate woman. At birth the child was extremely small, and when a fortnight old, only weighed 2½ pounds. As a result of unremitting care and attention, the parents succeeded in rearing her, but she was always backward in body and mind, and when I saw her at the age of three and a half years, she was no bigger than an average baby of twelve months. She could crawl, but was quite unable to stand or walk, and the dorsiflexion of the great toes indicated that the myelination of the spinal motor tract was still imperfect. Movements of the hands and fingers were fair, she could seize anything, and could pick up a sixpence from the table. She was quite unable to speak, and made sounds like a baby during its first year. The circumference of the skull was 17½ inches, corresponding to that of a normal child between the ninth and twelfth months, and there was a considerable deficiency in the frontal and parietal regions; but there were none of the ordinary stigmata of degeneracy. The child's special senses appeared to be normal. She could understand, and obey simple commands, was fond of pictures, and pointed to such common articles as a key, penny, knife, when told to do so. Her power of attention was good, and she would amuse herself for a considerable time with toys. She was clean in her habits, and could feed herself; in fact, her mother said that she was able to eat an egg with a spoon as neatly as a grown-up person. Unfortunately, the child succumbed shortly afterwards to enteritis, but I think it is highly probable that had she lived there would always have been some mild degree of mental impairment. A somewhat similar case was that of a girl brought to me at the age of six years, who in her mental and physical development corresponded to a normal child of about three years. There was no record of the weight at birth, but she was said to have been so small that it was thought she could not possibly live. Here, also, I think it is very doubtful whether mental development will ever be complete. I have seen several similar cases which have arrived at maturity, and have then presented a mild degree of feeble-mindedness.

With regard to malnutrition arising after birth, the effect does not seem so serious, and, as I have already remarked, although there may be some mental retardation, this is usually of a temporary nature, and is recovered from as the physical condition improves. Occasionally, however, a mild degree of defect remains, but it is always

mild, and I have never known or heard of idiocy, or even imbecility, resulting from this cause.

One of the commonest disturbances of nutrition occurring in infancy is that due to rickets, and a "rachitic idiocy" has been described. I have never seen such a case. Rickets may, of course, complicate primary or secondary amentia, and there can be no doubt that the mental development of the rachitic child is often delayed and abnormal; but, so far as my experience goes, rickets alone has never produced amentia. On the contrary, I know several adults of marked intellectual ability who show clear evidence of having suffered from severe rickets in childhood.

ISOLATION AMENTIA.

(AMENTIA DUE TO ISOLATION OR SENSE DEPRIVATION.)

The growing brain cells not only require to be supplied with their own particular food, but they must also be stimulated by vibrations transmitted through the special sense pathways. The effect of these is probably similar to that produced by rays of light upon plant development, and in their absence cellular growth is as imperfect as if the brain had been starved. This is well shown by the marked agenesis of the occipital cortex which occurs as a consequence of congenital non-development of the organs of vision—a fact which has been ably utilized by J. S. Bolton to accurately map out the visual area. But not only are sensations thus necessary for growth: they are also the materials out of which thoughts and ideas are built, and the sum total of them constitutes *mind* Should, therefore, a single sensory avenue be closed, as in blindness or deafness, the mind must for ever remain the poorer by the impressions which would have entered through this channel, and if two or more senses are defective, the mind may be so impoverished as to bring about a condition of true amentia.

As we have already seen, such sensory defects are occasionally present in primary amentia, and they are then complications which usually impose an insuperable obstacle to successful training. In secondary amentia, however, which we are now considering, there is no intrinsic incapacity of the cortical neurones, and if other sensory channels can be so utilized as to compensate in some degree for those diseased, the mental capacity may be but little impaired. Suitable training may therefore prevent the

development of secondary amentia from these causes. That this is so is fully shown by the excellent results achieved in training establishments for the blind and deaf, as well as by some classical examples in which disease of several sensory channels had existed.

The common cause of the sensory deprivation in these cases is inflammation resulting from one or other of the infectious fevers; the lesion is usually at the periphery, and the organs most frequently affected are those of sight and hearing. Amentia can only result when such occurs during early childhood (whilst cerebral development is immature), and where special educational training has been withheld or has failed. In the absence of a neuropathic inheritance I believe failure to be exceedingly rare, and the cases of this form of amentia which are met with are nearly always in persons whose early education has been neglected. They are, in fact, as much sufferers from a deprivation of special education as of special sense. I have met several such cases in remote country districts. The child, deprived of sight or hearing in early life, is thereby excluded from the village school. The local authority provides no special form of education, and does not further concern itself with him. There may be institutions for the blind and deaf but ten miles away, but it is no particular person's business to secure him admission, and he gradually grows up without any training. He soon passes the age at which such would be of avail, and becomes an incurable ament. Although such a state of affairs still exists, it is less common than in years gone by. The necessity for, and great benefit to be derived from, training is now much more generally recognized, and in consequence cases of amentia due to sense deprivation are not nearly so prevalent as formerly. At the present time they comprise only a fraction of all cases of amentia, although the total number in existence is still considerable.

These patients are usually well grown and free from any stigmata of degeneracy. In the majority of instances the mental defect is mild, but it is not uncommon for it to be accompanied by hallucinations and delusions, and sometimes the behaviour is so erratic and untrustworthy as to necessitate committal to an asylum for the insane.

Illustrative Cases.

The two following are good examples of this form of amentia as commonly met with:

Mild Amentia consequent upon Early Deafness.—W. S., male, fifteen years of age. No morbid heredity. Was either born deaf or became so shortly after birth, and has never spoken. He was refused admission to the village school, and has received no education. He is well grown for his age, and has a pleasing expression. He can understand many signs, and can express many of his wants in the same way. Beyond helping his mother in the house at times, he is quite unemployed. He is by no means lacking in the faculties of imitation and imagination, and is fond of drawing on a slate or scraps of paper. It is quite evident, however, that his ideas are extremely crude and childish. In addition to his intellectual defect, he has little power of control, and is becoming more and more subject to outbreaks of passion and waywardness. On several occasions he has wandered away from home. His mother states that he is affectionate, but "cannot bear to be crossed." I am of opinion that in this case suitable training in a school for the deaf would have prevented the mild amentia now present, and would have resulted in the patient becoming a useful member of society. Even at this age I strongly urged the desirability of such training, as without it there is no doubt that he will gradually become more intractable, and will finally drift into an insane asylum.

The Earlswood case also is probably one of amentia due to deafness, but as this patient has developed a most extraordinary degree of mechanical skill, I have thought it better to describe him under the chapter on Idiots Savants.

Mild Amentia consequent upon Congenital Blindness.—E. W. C., male. Born blind. No education. Admitted into imbecile institution at the age of fifteen, but found to be intractable and violent, and transferred to lunatic asylum. He is now twenty-nine years of age, and is a tall, well-developed and well-nourished man of pleasing expression. Cranial circumference, 22¾ inches. No stigmata of degeneracy. He is quite blind, the eyes being represented by rudimentary bulbs of white, opaque, sclerotic tissue without any indication of cornea or iris. His memory is good; he has a tolerably good knowledge of places and events, can under-

stand all that is said to him, and can give a fair account of himself. He possesses imagination, but his ideas are simple and childish, and his power of reasoning is decidedly defective. He cannot read, write, sum, or do any kind of work, and he spends the day rocking himself to and fro in a chair and muttering to himself. After answering a question, he rambles on to himself in an incoherent way about analogies and philosophy. When asked what a philosopher is, he says: "A man who tries to make everybody else better." He then immediately goes on to talk about *Ally Sloper*, which, he says, has been read to him. He has aural hallucinations and delusions, and is very emotional and untrustworthy. In spite of his beatific appearance, he is liable to frequent outbreaks of sudden violence, and has repeatedly attacked the other patients. He is also a confirmed masturbator. (See Plate XXII., Fig. 53.)

The following well-known cases may be briefly referred to in this place, as showing the really remarkable results which may attend the systematic education of patients suffering from severe sense deprivation.

*Laura Dewey Bridgman.**—An attack of scarlet fever at the age of two years caused suppuration of both eyes and both ears; taste and smell were also impaired. She was quite deaf, and sight was entirely abolished in the left eye; but she retained a slight perception of light in the right eye up to the eighth year, after which she became completely blind. She was admitted to the Perkins Institution for the Blind at Massachusetts at the age of seven years ten months, and received systematic education under Dr. Howe until she was twenty. Owing to the unremitting care and patience of Dr. Howe in training her cutaneous sensation (the only sense unimpaired), she became able to read and write in the deaf and dumb language, to express many of her feelings, to sew, knit, and perform certain household duties, and, in short, to live to a great extent the life of an ordinary person. She remained in the Perkins Institution until her death, at the age of sixty years. The general conclusion arrived at regarding her by Mr. Sangford was that "she

* See the "Life of Laura Bridgman," by M. S. Lamson, Boston, 1878; also an account by Dr. Howe in the Forty-Third Annual Report of the Perkins Institution and Massachusetts Asylum for the Blind. A very good abstract of this is given by Dr. Ireland in his "Mental Affections of Children."

The brain was very carefully examined by Dr. H. H. Donaldson, and described by him in the *American Journal of Psychology*, September, 1890, and December, 1891.

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FIG. 53.—Mild amentia due to congenital blindness.

FIG. 54.—The "genius" of Earlswood Asylum. Age, 73 years. Mild amentia due to deafness. (*For description see Text.*)

PLATE XXII.

was eccentric, not defective; she lacked certain data of thought, but not in a very marked way the power to use what data she had." The post-mortem examination showed that the auditory nerves, the optic nerves and tracts, and the olfactory bulbs, were very small. The grey matter of the cortex generally was thinner than usual, especially in the occipital, cuneus, and temporal lobes. In these situations there was also a deficiency in the number of nerve cells. There was a considerable non-development of the inferior frontal and temporo-sphenoidal convolutions covering the island of Reil, particularly marked on the left side. The cranial circumference was 20·8 inches.

In two other pupils of the Perkins Institution—namely, *Oliver Caswell* and *Helen Keller*—the results were almost equally remarkable. Miss Helen Keller lost sight and hearing at the age of nineteen months. She received unremitting care, and soon mastered the deaf and dumb language. By means of the Braille system she subsequently acquired French, German, Greek, and Latin, and then developed the power of oral speech. She passed the Harvard preliminary examination with honours at the age of nineteen years, and had a distinguished college career, afterwards writing several books, and evincing high intellectual capacity. *Meystre*, of Lausanne (Switzerland), was born deaf and dumb, and he lost his sight by an accident at the age of five years. By unremitting attention he was taught to articulate, and at the age of eighteen he was described as "a lively, intelligent, and good-humoured fellow, an excellent carpenter, a first-rate turner, and runs about the building with a certainty and confidence which none of the merely blind pupils acquire. He has a great many ideas, and an instinctive dread of death."

*Agnes Halonen** was born in Finland in 1886. At the age of eighteen months she became blind from scarlet fever, and a year afterwards became deaf. She very soon ceased to speak, and expressed her wants by means of a few simple signs, such as putting her hand to her mouth when she wanted food. She could recognize members of her family by touch. At the age of eight she was sent to the Blind School at Helsingfors. Here she was taught to sew and knit, as well as the finger alphabet. At the age of seventeen she could read books in Braille and Moon's characters, and she

* "The Blind Deaf-Mute, Agnes Halonen," by Aug. Helin, Stockholm. Abstract in *Journal of Mental Science*, April, 1904, p. 336.

could also write. She had some knowledge of geography, which had been taught her by means of raised maps. She knew many of the capitals, mountains, and rivers in Europe and Asia, and she had a knowledge of the habits of plants and animals. She was able to sew, spin, crochet, plait, and make brushes, and generally was very intelligent.

Kaspar Hauser.—No account of this subject would be complete without a brief reference to this celebrated and mysterious case. It differs from the foregoing in that there was no disease of the sensory pathways, but the environment of the child for many years was such that they could not be exercised. It may fittingly be described as a case of mental arrest due to isolation.

On May 26, 1828, a youth, apparently about sixteen or seventeen years of age, was found near one of the gates of Nuremberg. He was unable to give any account of himself, and inquiries failed to discover how or whence he came or who he was. He was 4 feet 9 inches in height, very pale, with short, delicate beard on his chin and upper lip. His feet were tender and blistered, and showed no signs of having been confined in shoes. He scarcely knew how to use his fingers or hands, and his attempts at walking resembled the first efforts of a child. He could not understand what was said to him, and replied to all questions by a single phrase: "I will be a trooper, as my father was." His countenance was expressive of gross stupidity. He appeared to be hungry and thirsty, but refused everything offered to him except bread and water. He held in his hand a letter stating that the bearer had been left with the writer, who was a poor labourer with ten children, in October, 1812, and who, not knowing his parents, had brought him up in his house, without allowing him to stir out of it. This was regarded as being intended to deceive. Upon a pen being placed in his hand, the youth wrote the words "*Kaspar Hauser.*"

After an official inquiry—which, however, revealed nothing—he was adopted by the town of Nuremberg, and Professor Daumer undertook his education. He was found to be extremely child-like, and to have no knowledge of the most simple facts of every-day life. But he had a remarkable faculty of smell and for seeing things in the dark, and under the instruction of Daumer his mind expanded in a wonderful manner. In fact, probably as a consequence of its sudden awakening into activity, he became ill, and his education had to be discontinued for a time.

He was taught the use of language, and after a time was able to record his recollections. He said that he had always lived in a small, dark cell, continually seated on the ground. He had had no covering, except a shirt and trousers, and had never seen the sky. When he awoke from sleep he was accustomed to find near him some bread and a pitcher of water, but he never saw the face of the person who brought them, and he had no knowledge that there were any other living creatures besides himself and the man who brought him food. This man eventually taught him to write his own name, and finally brought him to the Nuremberg gate.

For a time mental development took place with great rapidity, but the prolonged isolation had wrought an effect upon the brain cells from which they could not completely recover, and after a time their potentiality became exhausted and no further progress was made. He was taken under the protection of Lord Stanhope, and he was subsequently employed in the Court of Appeal, but he showed little real capacity for work. On October 17, 1829, he was found bleeding from a slight wound which he said had been inflicted by a stranger. On December 14, 1833, at Anspach, he met a stranger by appointment, on the promise that the mystery of his birth would be revealed. During the interview he was mortally stabbed, and he died three days afterwards.

A post-mortem examination showed a somewhat thickened skull and rather small brain, which did not completely overlap the cerebellum. The convolutions of the brain were also simpler than normal.

The mystery of Kaspar Hauser's birth and death attracted widespread interest, and has never been solved. It was contended by Earl Stanhope and the Duchess of Cleveland that he was an impostor, but this view was strongly combated by both Professor Daumer and the eminent Bavarian jurist, Von Feuerbach. The latter considered that Hauser was heir to a princely German house, put out of the way to favour another succession. A careful examination of the facts regarding his condition when first found, his subsequent limited progress, his untimely and mysterious death, and the state of his brain, seem to show that his account was a truthful one, and that he exemplifies in a unique manner the effects of a prolonged isolation upon the cells of the brain.

CHAPTER XIV

IDIOTS SAVANTS

We have seen that amentia is often characterized by an irregular as well as a defective mental development, and in a small number of patients this is so marked as to result in special aptitudes which are quite phenomenal, not merely in comparison with aments, but often with the acquirements of ordinary persons. These persons are conveniently described as "idiots savants." The condition is exceptional and relatively uncommon; on the other hand, it is not so rare but that a considerable number of cases have been recorded.

Presumably the special aptitude is related to an increased development of certain cerebral neurones, but as to how and why this is brought about we can only conjecture. In many of the cases I have seen there has been a clearly marked predilection (which, however, has rarely been marked in the ancestors), and I can only assume that this is the result either of some primary developmental anomaly or of some fortuitous circumstance of early life which has aroused the child's interest in a particular direction, and thence led to the concentration of all his mental activities upon the one object. The talent, whatever it is, and however originating, certainly owes much of its development to constant exercise.

It is to be noticed that although these persons are spoken of as "idiots," they are rarely of the lowest grade of mental defect. Most of them would more properly be classed as imbeciles or merely feeble-minded. It is remarkable, however, that they almost invariably belong to the male sex, female idiots savants being very rare.

Peterson is of opinion that the talents of these persons lie chiefly in the direction of imitation, and that they have no capacity for originating. He also thinks that they are frequently lost before adult life. These statements are undoubtedly true of many cases, but they are by no means invariably so. I doubt whether the latter

one is even the rule, and several illustrations to the contrary will be cited in the following pages.

The nature of these phenomenal acquirements varies considerably. In some persons the talent consists of an extraordinary development of one of the *special senses*. Thus, Jules Voisin describes the case of an imbecile with a wonderful delicacy of smell. She never ate or drank anything without smelling it, and if given coffee (for which she had a great fondness) in a glass which had contained wine, she would at once detect it and refuse to drink. Imbeciles have been described who were able by the sense of smell to pick out their own and their companions' clothes, and Séguin noticed many idiots even, in whom this faculty was developed to an extraordinary degree.

In other cases there is an increased development of the visual sense. Several of the drawing and mechanical geniuses have a wonderful capacity for detecting slight differences of form and size, whilst the following case, mentioned to me by Dr. R. Langdon Down, is an excellent example of this class. It is that of a boy, a patient at Normansfield, whose hobby was the collection of small bright articles of any description, and this interest had so cultivated his quickness and sharpness of sight that nothing in the shape of a pin, a minute fragment of broken glass, or any shining particle, which was invisible to the ordinary person, ever escaped him. Other patients have a phenomenal sense of hearing—as, for example, the wild boy of Aveyron described by Itard, as well as some who will presently be mentioned on account of their speech and memory. Finally, there are some cases in which the hyper-development concerns the tactile sense. Dr. R. Langdon Down tells me that there used to be a boy at Normansfield whose sense of touch was so delicate and fingers so deft that he could take a page of the *Graphic* and gradually split it into two perfect sheets, as one would peel a postage-stamp off an envelope.

In another group of cases it is chiefly in the motor functions that these extraordinary talents lie. Sometimes there is an almost incredible capacity for the performance of mechanical work requiring the greatest cunning and dexterity, and as an example of this the Earlswood case, which will presently be described, is probably unique. In other persons the gift takes the form of drawing, and many of the walls of Earlswood Asylum are at the present time adorned by beautifully executed crayon drawings (copies of well-

known pictures) which were done by the mentally deficient brother of the patient just referred to. Occasionally the talent for drawing passes beyond mere picture-copying, and shows the presence of a real artistic capacity of no mean order. This was the case with the celebrated Gottfried Mind,* who had such a marvellous faculty for drawing pictures of cats that he was known as "The Cats' Raphael." Gottfried Mind was a cretin imbecile who was born at Berne in 1768, and died in the same city at the age of forty-six years. At an early age he showed considerable talent for drawing, and as it was obvious that he would never be able to earn his living in any ordinary occupation, his father's employer interested himself in providing young Gottfried with some training. He could neither read nor write, he had no idea of the value of money, his hands were remarkable for their large size and roughness, and his general appearance was so obviously indicative of mental defect that his walks through the city were usually to the accompaniment of a crowd of jeering children. In spite of all this his drawings and water-colour sketches of not only cats, but of deer, rabbits, bears, and groups of children, were so marvellously lifelike and so skilfully executed that he acquired a European fame. One of his pictures, indeed, of a cat and kittens was purchased by King George IV.

Under the heading of motor we may also describe those cases possessing, if not the gift of tongues, at all events an extraordinary capacity for reproducing spoken words. Dr. Martin W. Barr† describes an epileptic idiot, aged twenty-two years, who, in spite of the most careful teaching, could learn neither to read nor to write, although he was able to perform small domestic duties. Spontaneously he hardly spoke at all, and then only short disconnected words or the simplest sentences; but he had an extraordinary capacity for repeating fluently and with proper intonation everything said to him whether in his mother-tongue or in such languages as Greek, Japanese, Danish, Spanish, etc. Probably those cases in which an imbecile will reel off cantos of poetry verbatim also belong to this category.

In a considerable proportion of these idiots savants the gift is one of *memory* in some form or other, and of this many interesting

* See an interesting account of Gottfried Mind, with many illustrations of his work, in *The Animal World*, January, 1909, by E. G. Fairholme.

† M. W. Barr, "Some Notes on Echolalia," *Journal of Nervous and Mental Disease*, January, 1898.

and remarkable examples have been described. At the present time there are two such in Earlswood Asylum. One of them is a man, sixty-five years of age, suffering from high-grade amentia, whose penchant is biographical history. It is only necessary to mention to him the name of any prominent personage in early or ancient history, and out there flows in a steady, unhesitating stream a full account of his birth, life, and death. His knowledge has been acquired by poring over biographical details in such books as were available, and is, of course, simply a matter of memory. It is not, however, merely repetitive, for he stands cross-questioning in a manner which shows that he has some knowledge, although not full understanding, of the occurrences he is talking about. Dr. Caldecott tells me that until the last few years there has been no decline in this man's capacity; latterly, however, he has begun to show signs of mental and bodily old age. The other case is a somewhat younger man, aged fifty-six years, whose memory also relates to dates and occurrences, but only such as have come under his own notice. He is a most valuable referee on matters connected with the previous life of the institution, and can repeat the year, month, and day of coming and going, of all the medical officers during his period of residence.

Dr. R. Langdon Down showed me a similar case at Normansfield, the patient being a high-grade imbecile thirty-eight years of age. In this case the phenomenal memory chiefly relates to number, but the patient has also a pronounced sense of locality. His speciality is the calendar, and if given any date during the last five years, he will state the day of the week correctly without any hesitation. But he seems almost equally at home with the hymn-book, and will promptly give the number of any hymn of which he is given the first line, or *vice versâ*. His home is near Maida Vale, and on being asked what streets he would have to pass through in going home from Waterloo terminus, he named each one without the slightest hesitation. This patient can also give the product of any two numbers under twenty with the rapidity of a reflex movement.

A similar case was shown by Dr. Witzmann at a meeting of the Society for Psychiatry and Neurology in Vienna.* The patient, an inmate of an idiot asylum, aged twenty years, possessed an extraordinary memory for certain of the data recorded in calendars.

* Reported in the *Lancet*, June 5, 1909, p. 1641.

MICROCOPY RESOLUTION TEST CHART

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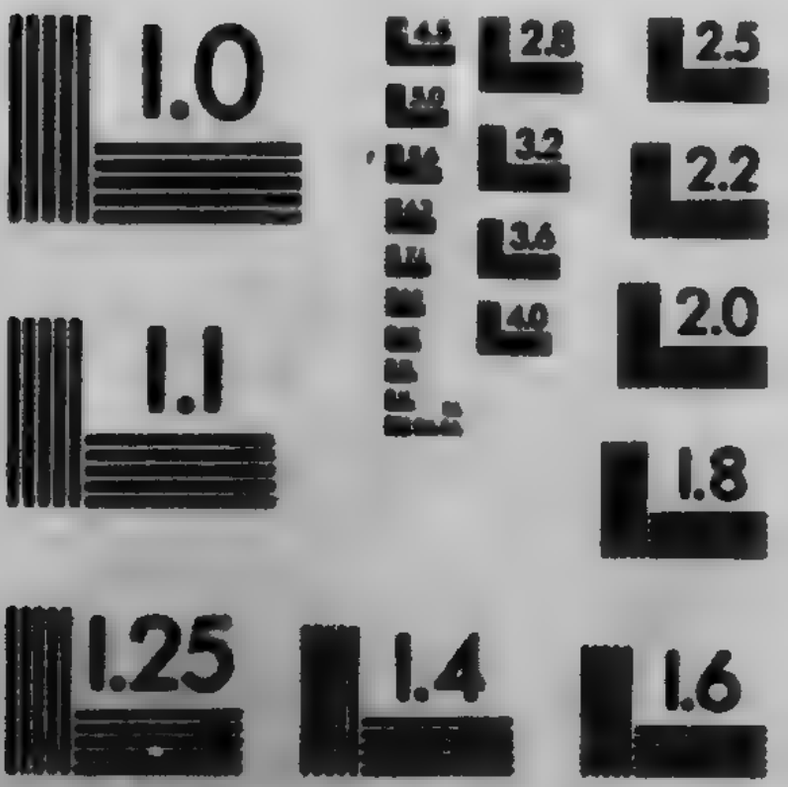

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He could tell with the utmost readiness what day of the week it had been, or would be, on any given date of the month in any year during the long period from the year 1000 of the Christian era until the year 2000. He also knew the patron saint of each day of the month. For instance, such test questions as the following were put to him, and answered correctly instantly. *Question:* What was the day of the week on October 3, 1907? *Answer:* Thursday. *Question:* What was the day of the week on June 14, 1808? *Answer:* 1808 was a leap year; June 14 was a Tuesday. The patient could read and write only tolerably well, was backward in arithmetic, and had no aptitude whatever for manual work. It seemed probable that he had actually learned by heart the date of Easter for each year from 1000 to 2000, and that his memory of this, together with some kind of simple code of his own devising, enabled him to give the correct answers almost immediately.

Dr. Forbes Winslow* mentions the case of a man who could remember "the day when every person had been buried in the parish for thirty-five years, and could repeat with unvarying accuracy the name and age of the deceased, and the mourners at the funeral. But he was a complete fool. Out of the line of burials he had not one idea, could not give an intelligible reply to a single question, nor be trusted even to feed himself."

Other cases show the existence of this phenomenal memory in its simplest automatic form. Thus, there are many idiots who cannot speak a single word, and yet can hum a tune, which they have only heard once, with perfect accuracy. Other aments will reel off poetry almost *ad infinitum*, yet without any understanding of the sense of what they are saying, or even of the meaning of the words. Dr. Langdon Down has described the case of a boy who, having read a book, would correctly recite whole pages word for word. Dr. Maudsley mentions the case of an imbecile who could similarly repeat verbatim a newspaper he had just read, as well as another more remarkable patient who could repeat backwards what he had just read.

Most aments are fond of music, and some particularly so, but in a few instances this propensity has an extraordinary development. One of the most striking examples of this is furnished by Dr. Trélat, and this case is also interesting in being a female. Dr. Trélat† says

* Quoted by Ireland.

† Trélat, "La Folie Lucide," etc., Paris, 1861. Quoted by Ireland.

that "they had in the Salpêtrière an imbecile born blind, affected with rickets, and crippled, who had great musical talents. Her voice was very correct, and whenever she had sung or heard some piece she knew perfectly well the words and the music. As long as she lived they came to her to correct the mistakes in singing of her companions; they asked her to repeat a passage which had gone wrong, which she always did admirably. One day, Géraldy Liszt and Meyerbeer came to the humble singing-class of our asylum to bring her their encouraging consolations." Dr. Séguin and Dr. Barr* also record cases in which a pronounced musical capacity was present.

Lastly, in marked contradiction to the general failing of aments in this respect, a few of these persons have an extraordinary capacity for arithmetic and calculations. One case described by Dr. J. Langdon Down is that of an inmate of Earlswood Asylum, an imbecile boy of twelve years, who could multiply three figures by three other figures with lightning rapidity. Dr. Howe has also recorded the case of a low-grade ament who, if told the age of anyone, would in a very short time calculate the number of minutes he had lived. Dr. Wizel† also records the case of an imbecile (apparently suffering from secondary amentia) who had a most remarkable faculty for arithmetic, particularly multiplication and division. For instance, she divided (mentally) 576, 560, and 336 by 16 with astonishing quickness; she multiplied such numbers as 23×23, 45×18, 78×78, almost immediately and by a peculiar method of her own. And yet at addition and subtraction she was remarkably poor, and said that $57+63=141$, $48+53=163$. At the present time there is a mentally defective boy, aged twelve years, in the Littleton Home who possesses the same gift, although markedly lacking in other scholastic acquirements.

We may conclude this chapter on idiots savants with an account of the following extremely interesting case:

The Genius of Earlswood Asylum.

Since the year 1850 there has been resident in Earlswood Asylum a patient who has justly earned this title, and whose skill in drawing, invention, and mechanical dexterity is certainly unequalled by an

* M. W. Barr, "Mental Defectives," 1905.

† A. Wizel, *Archiv für Psychiat.*, Band xxxviii., Heft i.

inmate of any similar institution in existence. At the present time, although seventy-eight years of age, he still continues to be actively engaged in his workshop. I am greatly indebted to Dr. Caldecott for his kindness in giving me permission to examine this patient and his wonderful productions; also for freely placing at my disposal a mass of particulars and photographs regarding him which he has taken great trouble to collect.

J. H. Pullen was born in the year 1835. The family history is somewhat scanty, for the reason that the only informant now available is the patient's sister; but, as far as can be ascertained, the parents and grandparents were steady, sober, hard-working people, and there is no history of insanity, epilepsy, or any of the usual antecedents of primary amentia. The parents, however, were first cousins. Of thirteen children born in the family, six died in infancy, and of the remaining seven only three are now living. It is extremely interesting to note that another brother was deaf and dumb, and had an even greater aptitude for drawing than the patient; he died in Earlswood Asylum of cancer at the age of thirty-five years.

There are no particulars as to the age at which the patient began to walk, but he did not talk until seven years, and for a long time only uttered the word "muvver." He never went to school, as no school would take him. He showed an early taste for drawing, and used to spend the greater part of his time at this occupation or in carving ships out of bits of firewood. Such instruction as he had he received from his parents and brothers and sisters at home, and from these he learned to write and spell the names of simple objects, but this was practically the sum total of his scholastic acquirements.

Pullen was admitted to Earlswood Asylum at the age of fifteen years. On admission he was found to be active and well grown, his height being 5 feet 7¼ inches, and his weight 9 stones 11 pounds. The cranial circumference was 21⅝ inches. He was described as having a good memory and power of imitation, and as being fond of drawing and examining how things were made. His senses of taste, smell, and touch were good; he was able to wash, dress, and take care of his person, but his speech was very imperfect and he was *very deaf*.

He was put to work in the carpenter's shop, and soon became an expert craftsman. It was clear, moreover, that he possessed a capacity for initiation, imagination, resource, and attention far

[To face page 308.]

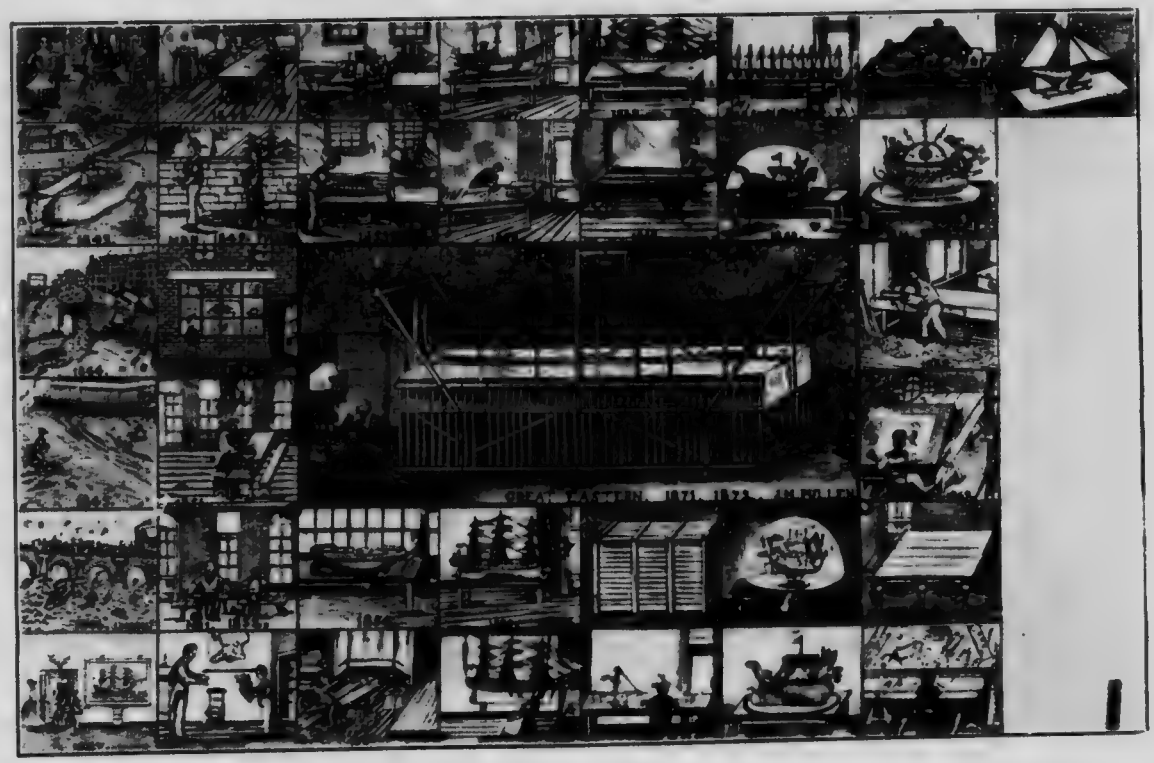

FIG. 55.—Photograph of the patient's own diagrammatic history of his life; showing his principal occupations and the results of his work between the years 1841, when a little boy, and 1873, when aged 38 years.

above the other inmates, and in consequence he was allowed considerable liberty of action and freedom to follow his own bent. The result, after sixty years, is to be seen in the fifty to sixty crayon drawings, the carvings in ivory and wood, and the wonderful models of ships and the like, which to-day adorn the walls and fill the two large workrooms placed at his disposal in Earlswood Asylum. Some idea of his skill in drawing and mechanical invention will be gathered from the accompanying photographs of his work (Plates XXIII., XXIV., XXV.), but, as Dr. Caldecott very truly says, it is difficult by this means to really appreciate their beauty, to do which the originals must be seen.

Pullen has designed and drawn a pictorial history of his life, which shows his chief occupations between the years 1841 and 1873. A reproduction of this is given in Fig. 55.

One of the most wonderful of his works, and the one of which he is the most proud, is the model of a steamship which he has named the *Great Eastern*. This, I think, he rightly regards as his *magnum opus*, and it attracted universal admiration at the Fisheries Exhibition, where it was shown in the year 1883. It took him three years and three months to complete, and every detail, including brass anchors, screw, pulley-blocks, and copper paddles, were actually *made* by the patient from careful drawings, which he prepared beforehand. The planks of this leviathan are fixed to the ribs by wooden pins to the number of nearly a million and a quarter. All of these were made by Pullen in a special instrument, which in turn he also planned and made. He also devised and executed a strong carriage on four wheels for the conveyance of the ship. The model is 10 feet long, 18⅝ inches wide, and 13⅝ inches in depth. It contains 5,585 copper rivets, and there are thirteen lifeboats hoisted on complete davits, each of which is a perfectly finished model. It is fitted with paddles, screw, and engines, and it contains state cabins, which are decorated and furnished with chairs, tables, beds, and bunks. In fact, the whole thing is complete to the most minute detail, and will bear the closest inspection. (See Fig. 59.) He has invented and attached an arrangement of pulleys by which the whole upper deck may be raised so as to show the parts below. I believe that when first put into water the huge model capsized, but that has since been remedied. It is perhaps hardly to be expected that a person with no knowledge of practical boat-building should succeed in making a vessel that would be really

navigable, but as a highly finished model it is unmatched in its completeness.

Another of Pullen's productions is an immense but most beautifully finished kite in the form of a ship under full sail. Another is a fully rigged man-of-war of the old wooden type. This is copper-riveted, and contains forty-two brass cannon, all of which were made by the patient. The rigging contains 200 pulley-blocks, all capable of working. (See Fig. 57.) Another production, which testifies to his imaginative as well as mechanical faculty, consists of a fantastic barge most beautifully carved out of ivory, ebony, and various fancy woods. Upon the prow are seated four angels carved out of ivory, whilst the stern is occupied by a figure of His Satanic Majesty. There are twelve oars, beautifully jointed, and worked mechanically from one centre-rod.

One of his most recent pieces of work is the representation of a monstrous human form about 13 feet high. This black-bearded, terrible-looking figure is armed with a gigantic sword, and can be made to perform a variety of movements, such as opening and shutting the mouth and eyes, protruding the tongue, rotating the head, raising the arms, etc., by means of a most elaborate internal mechanism. It is calculated to strike terror into the heart of any juvenile beholder. Of this, with the White Knight, he may truly say, " It's my own invention."

Other productions include bookcases, chairs, tables, work-benches, picture-frames, and the like; in fact, the list of his work during the sixty-three years he has been in the asylum would alone fill several pages of this book.

In disposition Pullen is usually quiet, well-behaved, and good-tempered, and he seems to be perfectly happy so long as he is allowed to work out his own ideas when and how he pleases. He is intolerant of supervision, inclined to be suspicious of strangers, and easily affronted by injudicious busybodies. At times he gets a little out of hand, and if denied requests which are quite unreasonable is apt to become sulky or passionate. On one occasion he threatened to blow up the place because a request had been refused, and it is quite likely that he would have attempted to do so had he not been mollified. On another occasion he did actually partially wreck his workshop in a fit of passion. Many years ago there was a steward of the asylum to whom Pullen took a violent dislike, and he spent many days planning his destruction. This culminated in the

PRODUCTIONS OF THE "GENIUS" OF EARLSWOOD ASYLUM.

FIG. 56.—A crayon copy of the celebrated picture "Bolton Abbey."

FIG. 57.—A fully-rigged man-of-war of the old wooden type, and carriage, with the maker.

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erection over the door of a most diabolical instrument, which was intended to guillotine the unfortunate officer, and there is not the slightest doubt that it would have done so had it not gone off a fraction of a second too late.

He once became enamoured of a female whom he had chanced to meet outside the asylum. Nothing would satisfy him but that he should have his discharge and be allowed to marry her. He moped about, utterly refused to do any work or to listen to argument or persuasion, and it became clear that the position was critical. A happy inspiration occurred to a member of the committee, and a gorgeous naval uniform, resplendent in blue and gold, was procured. Pullen was invited into the board-room and informed that his case had been carefully considered, and that it had been decided to accede to his request. At the same time it was pointed out to him that the committee would be exceedingly sorry to lose his valuable services, and that, if he would reconsider the matter, they would, as an alternative, grant him a commission as Admiral in the Navy. The uniform was then shown to him as an earnest of their intention. This was too much for Pullen; he took the uniform, and has never since alluded to the subject of marriage. This uniform he usually dons on ceremonious occasions. (See Fig. 54.)

A note in the case-book describes him as "the quintessence of self-conceit," and a consuming vanity and almost overwhelming sense of his own cleverness and importance are very marked characteristics. Whilst showing me his handiwork he frequently stopped to pat his head and say, "Very clever"; and when I produced a tape-measure and asked permission to ascertain the extent of his cranial capacity he was delighted, and evidently regarded me as a very sensible fellow. At the same time, in spite of his childish egotism, he is by no means deficient in some power of looking after himself, and on several occasions he has been found selling privately and for his own advantage little articles he has made. Many of his works are carried out under the real or pretended idea that he has a commission for them at a contract price, and this childish fancy, as well as his extremely limited vocabulary, is illustrated by his private memorandum-book, the photograph of a page of which is shown in Fig. 58.

What conclusion are we to come to regarding the causation and pathology, even the mental status, of this remarkable man? His powers of observation, comparison, attention, memory, will, and

pertinacity, are extraordinary, as is fully shown by the foregoing account; and yet he is obviously too childish, and at the same time too emotional, unstable, and lacking in mental balance, to make any headway, or even to hold his own, in the outside world. Without someone to stage-manage him, his remarkable gifts would never suffice to supply him with the necessities of life, or even if they did, he would speedily succumb to his utter want of ordinary prudence and foresight and his defect of common sense. In spite of his delicacy of manipulation he has never learned to read or write beyond the simplest words of one syllable. He can understand a little of what is said to him by lip-reading, and more by signs, but, beyond a few words, nearly all that he says in reply is absolutely unintelligible.

My own conclusion, based upon several interviews and upon the particulars supplied me by Dr. Caldecott, is that the case is not one of *primary* amentia at all, but that it should really be classed as an example of mild *secondary* mental deficiency due to sense deprivation (deafness). Whether this deafness is the result of a congenital deficiency of the auditory mechanism or is due to disease I am unable to say, as the particulars of his early life are unfortunately very meagre; but I am inclined to think that it was owing to this deprivation that he was refused admission to school, that he was to a great extent cut off from intercourse with his fellows, and that he grew up uninstructed in, and ignorant of, ordinary scholastic attainments and the ways of the world. Left largely to himself, his amusement consisted in copying drawings and carving bits of firewood, as I have seen in other cases of early deafness. His isolated condition caused all the powers of his mind (which do not seem to me to have been intrinsically defective) to be devoted to, and concentrated upon, these occupations, with the result that he developed a power of copying drawings, of carving in wood (and later in ivory), and a general mechanical dexterity of the very highest order. The curious combination of extreme ability in these particulars, with his general childish simplicity, his egotism, suspicion of strangers, sullen or passionate outbreaks if thwarted, and, in fact, the whole of his mental characteristics, are, I think, explicable on this view. The condition is similar in kind, although differing in degree, to that frequently seen in neglected cases of congenital deafness, and it is not greatly dissimilar to t[illegible] of some non-idiotic savants who, absorbed in their one particular subject, have gradually lost interest in, and severed their connexion with, the outer world.

PRODUCTIONS OF THE "GENIUS" OF EARLSWOOD ASYLUM.

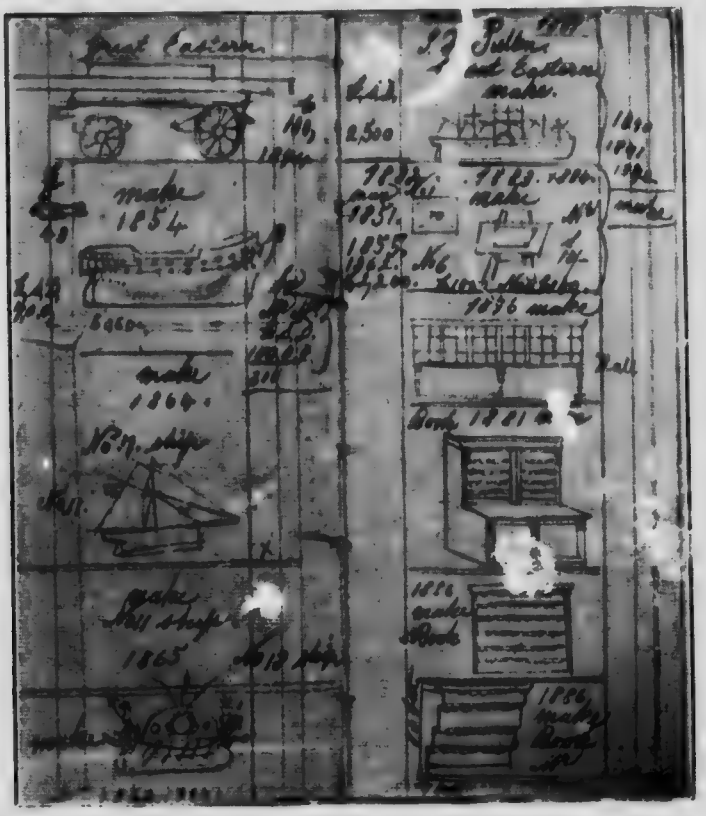

FIG. 58.—Photograph of the first page of the patient's private memorandum book.

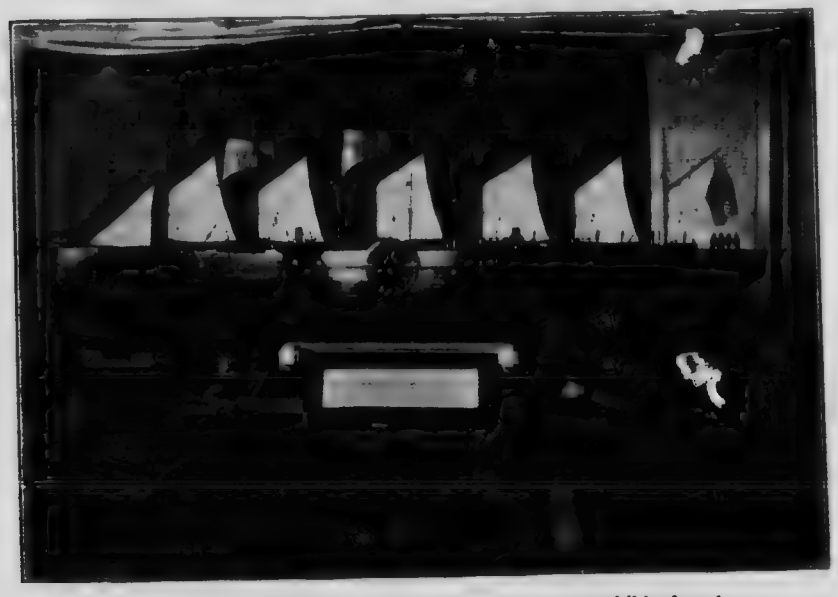

FIG. 59.—The *Great Eastern*, with its carriage, as exhibited at the Fisheries Exhibition, 1883. (*For description see Text.*)

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CHAPTER XV

MORAL DEFICIENCY AND CRIMINAL AMENTS

For the purpose of discussing moral deficiency we may say that morality is social virtue, and define it as the regulation of the conduct of the individual in accordance with the accepted ethical code of the community of which he is a member. Perhaps some persons would be inclined to look upon conduct as being dependent upon spiritual forces which transcend mind altogether, and therefore removed from the province of psychiatry. But whilst there may be badness as well as madness, the general tendency of modern investigations is undoubtedly to show that conduct involves mental activity, and that where this is disordered, aberrations of conduct and misconduct are apt to be the result. This view, indeed, is one which has long been held by alienists, and the person who has lost the power of regulating his conduct in the moral and social sphere is spoken of as suffering from "moral insanity,"* although the other functions of his mind may show little or no impairment. Similarly the person who has never developed this power may be said to be morally defective. This condition of moral defect is now recognized by law, and the Mental Deficiency Act of 1913 defines moral imbeciles as "persons who from an early age display some permanent mental defect coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect."

The use of the term "moral imbecile" is in accordance with the practice which has obtained for many years; but it is not to be assumed that persons who come within the scope of this definition necessarily belong to the imbecile grade of mental defect as we

* The term "moral insanity" was first used by Dr. J. C. Prichard in 1835. The condition was also described by Dr. Henry Maudsley in 1868, and is now well recognized by all psychiatrists.

have already described it. Some of them belong to this grade; but others of them are idiots, and the majority are probably merely feeble-minded. In order to obviate confusion it would in my opinion be better to discontinue the use of the term *imbecile* for the class as a whole, and to substitute that of *moral defective*.

Moral defectives, then, or, in official language, "moral imbeciles," are aments whose conduct is persistently vicious or criminal. But experience shows that persons coming within this category differ very much, both in the nature of their misconduct and in their psychological peculiarities, and hence, if only for purposes of description, some classification is desirable. Perhaps the best way to attain this, and to arrive at an understanding as to the psychological basis of their misconduct, is to consider what are the mental requisites to ethically correct conduct.

One of the chief of these essentials is what is known as *moral sense*, or the *feeling* that the individual is under certain obligations to the community of which he is a member. There are four chief "senses" or "sentiments" which, in varying proportions, go to make up the mind of average civilized man. These may be described as the logical or intellectual, the religious, the æsthetic, and the moral or social. The logical or intellectual sense causes us to test each new experience by the light of our previous knowledge, to criticize and carefully compare, and to accept or reject, according as our judgment affirms it to be true or untrue. Such a type of mind is said to be essentially rational. The religious sense implies a conception of the relationship between God and man. It is largely made up of the emotions of awe, reverence, and adoration, and religion has been well defined as "the feeling of reverence which men entertain toward a Supreme Being, or to any order of beings conceived by them as demanding reverence from the possession of superhuman control over the destiny of man or the powers of nature."* The æsthetic sense connotes a marked appreciation of all that is beautiful in form, colour, sound, etc. Whilst, lastly, by the *moral sense* is meant the faculty of appreciating the obligations due from man to his neighbours as component units of society.

Now, these various senses are differently developed in different individuals, and this is partly a result of special hereditary tendencies, and partly due to the nature of their early environment. Some persons are full of religious feeling, and yet absolutely illogical,

* Ogilvie and Annandale, "Imperial Dictionary."

inartistic, and immoral. I have no doubt that most medical men have met with individuals of this type who are most fervent leaders in the prayer meeting, most enthusiastic teachers in the Sunday-school, most highly esteemed as local preachers, and yet guilty of life-long immorality in all their domestic and business relationships. In some instances, perhaps in most, the religious fervour is assumed as a convenient cloak to mask their social shortcomings—it is hypocrisy pure and simple; but I do not think this is so in all, and I believe there may exist a strongly developed religious sense with an almost complete lack of moral sense. In other instances the æsthetic sentiment may be highly developed whilst the logical sense is lacking, and this is the case with many individuals who have achieved high success in the world of art. Finally, some individuals may possess the keenest intellect and the highest logical capacity and yet be utterly devoid of any sense of religion, art, or morality.

There can be no doubt that human conceptions regarding the obligations of the individual to society are ever changing with social development and the progressive evolution of the mental faculties. The same is true of our conceptions of religion and of art. The child is born completely devoid of any of these senses, and their development is a gradual process which is largely dependent upon the nature of the early training and environment. With regard to the moral sense, it seems likely that it is only by the constant force of example, the reiteration of precept, and the infliction of punishment, that the child gradually acquires a sense of the social and legal code of the community in which he lives—a standard of what is right and what is wrong—and is thereby enabled to conform to moral and social law. This result, however, is not entirely due to the environment. The development of such a feeling necessitates the presence of an innate capacity for its development, and there is every reason for thinking that some persons are so constituted that they are utterly devoid of this potentiality. Just as some may be fundamentally incapable of acquiring a religious, æsthetic, or logical feeling, the class we are now considering are fundamentally incapable of acquiring a moral feeling.

It seems likely that the germ of the religious feeling has been present in man from a very early period of his existence. The most primitive man, with any affective faculty at all, could hardly fail to be impressed and awestruck by many phenomena of Nature which, to his mind, could only be brought about through the agency of all-

powerful spirits. Hence there would gradually be evolved the religious sense. With the social sense it is different. Primitive man looked more to his own individual rights than to those of his fellows, and the social feeling only arose as it became necessary for the whole tribe to act together for some supreme purpose. It is probably to the necessity for common, concerted action of this kind that we must look for the first appearance of moral feeling. Since then it has, of course, undergone great transformation, and even in the past few hundred years an immense change has taken place in our views regarding the duties of man to his neighbour and to society. We may consider, therefore, that, phylogenetically, the moral sense is the latest to have been evolved, and it also appears to be the latest to make its appearance in the individual. This fact is not without its importance in considering the question of moral deficiency, for there are some individuals in whom this feeling develops so late in life as to give rise to the opinion that the faculty is absent altogether. I have known persons who, during childhood and adolescence, gave every indication of a want of this sense, and yet who subsequently evinced high civic worth and character. But although egoism is a much stronger and more deeply ingrained feeling in most of us than is altruism, it is probable that the proportion of members of a civilized nation who are fundamentally incapable of acquiring the social sense is comparatively small.

Nevertheless it by no means follows that the conduct of persons who are lacking in this sense will be such as to bring them within the legal definition of moral deficiency which has been quoted; it does not of necessity even follow that they will be guilty of offences against the legal or moral code of the community at all. In regard to the æsthetic sense, it is a matter of experience that persons may be utterly wanting in any conception of beauty or harmony, and yet manage to avoid infringing the canons of good taste by a rigid adherence to conventional formalities; it is equally certain that persons who are wanting in any real religious feeling may acquire a reputation for piety and reverence merely as a result of their scrupulous observance of religious form and ceremony. Such persons have no artistic or religious sense, but their intelligence shows them the propriety of conforming to a certain standard recognized by society, and the defect passes unnoticed. It is the same with a defect of moral sense. Although these persons have no *feelings* of repugnance or shame at the thought of a criminal or

immoral act, and although they cannot appreciate the ethics of the Decalogue, nevertheless their intelligence tells them that certain unpleasant consequences, in the shape of judicial punishment or social censure, will follow transgression, and this suffices to keep them within the prescribed legal and social code. Their moral defect is, in fact, latent. But although latent moral defectives of this kind are not of necessity actual criminals, they may well be described as potential criminals. They stand in the same relation to the inmates of our prisons as do the psychopaths or potential lunatics to the inmates of our asylums, or the improvident to the inmates of our workhouses, and there can be no doubt that it is from this class that one section of our criminals is drawn. Although there is no intellectual defect, and such persons fully realize the consequences of detection, yet occasionally the gain resulting from a crime or act of immorality appears so great, and the likelihood of discovery so small, that, moral sense being absent, they deliberately take the risk. On the other hand, should there be any coexisting impairment of the intellect, then the absence of moral sense will almost inevitably result in the persistent commission of criminal and anti-social acts in spite of punishment, and so bring the person within the legal definition of moral defect.

But the regulation of conduct requires something more than a sense of the rightness or wrongness of certain acts; it necessitates the presence of sufficient *will* to enable the person to follow the course which he knows to be right, and to eschew that which he knows to be wrong, and consequently a defect of will may lead to persistent wrongdoing, and bring the individual within the category of legal moral deficiency. This defect of will may make itself manifest under two separate and distinct conditions. In the first of these there is a general inertia; the individual is what is termed " wanting in character," he has no driving force, and no special propensities for either good or evil. He is facile, he simply follows the line of least resistance, and is swayed this way or that according to the happenings of the moment. It is obvious that the behaviour of such an individual will be entirely dependent upon the nature of his environment. Within the seclusion of an institution in which the influence is entirely good he may lead a highly moral, even saintly, life; exposed to the influence and machinations of evil-doers he is as clay in the hands of the potter, and just as readily embarks upon a career of crime.

The second condition in which a defective will shows itself is in an inability to inhibit immoral and antisocial impulses. The subject of morbid impulses belongs rather to the domain of mental perversion (insanity) than mental defect, but it is necessary to make a brief allusion to it here because such impulses are not uncommon in aments, and they lie at the root of one variety of criminal actions. As is well known, impulses of this kind occur with tolerable frequency, particularly in those of a neurotic constitution. Sometimes the impulse is to count a definite number before a piece of work, such as writing a letter, can be begun. Sometimes there is an irrepressible impulse to repeat some particular form of words; the " pink trip slip for a three-cent fare " of Mark Twain is a well-known illustration. It is recorded of Dr. Samuel Johnson that he could never take a certain walk without being impelled to touch every post he passed, and if one was accidentally missed he would go back to touch it. A patient of mine at one time had such a strong impulse to throw himself under the engine of a train entering a railway station that he never dare go on to the platform until the train had come to a standstill. Another lady patient could never take a railway journey without the feeling that she must throw herself out of the carriage door. On one occasion, finding herself left alone in a compartment, she was compelled to seek safety by locking herself in the adjoining lavatory for a distance of forty miles. So far as society is concerned impulses of this kind are comparatively harmless, but in other cases they take the form of an impulse to steal (kleptomania); to set things on fire, such as commons, heaths, haystacks, and houses (pyromania); to mutilate horses and cattle; and, by no means rarely, to commit homicide. It is perhaps a moot point whether one should regard cases of this kind as dependent upon a disorder of association and ideation, or upon a defect of will. It may be that the impulses have such an impelling power that no ordinary volition would be capable of withstanding them, and that consequently they should be placed in a separate category, under the heading of " morbid impulses." On the other hand, they are frequently resisted, and when this does not occur it may be owing to a defect of will. However this may be, there is no doubt that recurrent impulses of this kind occur periodically and with tolerable frequency in certain aments, and that the inability to resist them brings such persons within the class of incorrigible moral defectives. It occasionally happens that the

impulse is not of this definite character, there being simply a general explosiveness which causes the individual to kick over the traces on any and every occasion. Lastly, it is to be noted that neither the presence of morbid impulses nor of defective will are incompatible with a normally developed moral sense.

We may now consider to what these various mental abnormalities are due. I have said that the development of a moral sense, whilst necessitating a certain inherent potentiality, is largely dependent upon the nature of the early training and environment. The child who grows up in an atmosphere of selfishness, vice, and crime, cannot be expected to acquire that altruistic feeling which is the basis of moral conduct. For him lying, thieving, and licentiousness are meritorious rather than immoral, and legal punishment is only persecution by an implacable enemy. It is the same with defect of will. An inherent capacity is essential, but even with this the child who has only to express a wish to have it gratified, and who is never taught to control his impulses whilst young, is not likely at a later age to subjugate his feelings and desires for the good of the community. His power of inhibition is undeveloped, with the result that his lower animal feelings have full play, and his conduct becomes vicious, immoral, and antisocial.

We see, therefore, that an adverse environment may lead to the formation of traits which in their effect are practically indistinguishable from those characterizing the morally defective. If these traits have existed too long, they may even be irreformable, and they give rise to a type of habitual criminal who may well be termed a sufferer from acquired or secondary moral defect.

On the other hand, there are many persons guilty of persistent immoral and antisocial conduct whose upbringing has been all that could be desired. They have been reared in good homes, they have been exposed to good influences, and everything in the way of precept, example, even judicious punishment, has been tried to make them conform to the accepted code of their community. But it is all in vain; they remain incorrigible, and it can only be assumed that there is some fundamental brain defect which prevents them appreciating the difference between right and wrong, or which makes it impossible for them to avoid the commission of criminal and immoral acts. The presumption is that this defect is germinal in origin, and this is supported by the undoubted fact that a considerable number of these persons are the offspring of a stock many

members of which have either evinced similar propensities, or have shown definite indications of mental abnormality. This variety may be termed " primary moral deficiency."

One of the most interesting studies which has been made in this field during recent years is that of Gruhle.* It is based upon observations made upon 105 youths in the reformatory of Flehingen, in Baden, and the history of each case is given in detail. As the result of a most searching analysis into all the factors at work, Gruhle comes to the conclusion that bad environment was the sole or chief factor in 18 per cent. of cases, while in 82 per cent. inborn disposition was solely or chiefly responsible. In 46 per cent. of cases both these factors were considered to have been in operation.

It is to be noted that the *legal* definition of moral defect does not apply to persons who are vicious or criminal only: there must be permanent *mental* defect as well. It will, therefore, not be out of place to consider whether persistent moral and social misconduct may occur *without* intellectual deficiency. There is probably no question in psychiatry which has been more keenly discussed, and which even now is far from being settled. That a defect of moral sense or feeling may occur without any intellectual impairment is, I think, undoubted, and this is explicable on the view previously suggested that the ethical sense is of later phyletic evolution. But such persons, as already remarked, although incapable of moral feeling, are yet kept from the commission of immoral acts by their intellectual recognition of the consequences which may follow, and hence, while they may be potential criminals, they are by no means necessarily habitual criminals. The undoubted fact that many incorrigible criminals will converse upon ordinary, or even abstruse, subjects in an exceedingly intelligent manner, that some of them are actually possessed of talents beyond the common, and that not a few, in their commission of offences and their attempts to escape detection, may show a capacity, alertness, and cunning of a very high order, would at first sight impel one to believe in the existence of a condition of habitual criminality without intellectual impairment. But the satisfaction resulting from the acts they commit is very short-lived; it is inevitably followed by serious disadvantages in the form of punishment, and the fact that they are utterly unable to control their evil propensities when they know that punishment

* H. W. Gruhle, " Die Ursachen der jugendlichen Verwahrlosung und Kriminalität," *Heidelberger Abhandlungen*, 1912, Heft i.

has followed and must certainly follow again, implies a serious defect either of judgment or of volition, and so denotes the presence of a defect other than that of mere moral sense. Whilst, therefore, I quite agree with Dr. Maier,* in his interesting dissertation on moral idiocy, that there may be a congenital inability to appreciate the moral conditions of the environment in association with normal intellectual tendencies—in other words, that an individual may be intellectually normal and yet devoid of *moral sense*—it is necessary to recognize that there is a difference between this and incorrigible criminality, and I am disposed to think that where this latter occurs it is in itself indicative of some degree of mental impairment. The precise nature of this mental impairment probably varies in different cases. In some it may be a defect of judgment, in others a weakness of volition, in others a derangement of the associative and ideational functions, leading to the presence of irresistible impulses; but that some degree of mental defect is present can hardly be doubted, since the individual is quite incapable of foregoing a momentary satisfaction for a permanent advantage. I am here speaking only of incorrigible, *habitual* criminals.

It follows from this that persistent misconduct of the primary form—that is, that form which is due to innate defect of potentiality, and not to a pernicious upbringing—is closely related to amentia proper—that it is, in fact, merely a special variety of primary mental deficiency. Accordingly we should expect to find that habitual criminals are the result of similar causes and possess similar physical characteristics to ordinary aments. It must be admitted that this is not so in every case. I have met persons of this class who, in their antecedents and physical condition, seemed perfectly normal; indeed, it occasionally happens that the most diabolical cruelty and the most violent and persistent criminal conduct is concealed under an extraordinarily engaging manner and appearance. But these cases are rare, and my experience is that most persistent criminals are the offspring of a decidedly neurotic or mentally abnormal stock, and that they possess many characteristics identical with those occurring in ordinary aments.

This is corroborated by numerous investigations which have been carried out in recent years in England, America, Italy, France, Germany, and Russia with regard to the physical and psychological

* H. W. Maier, "Ueber moralische Idiotie," *Journal für Psychologie und Neurologie*, 1908, Band xiii.

features of the habitual or instinctive criminal class. Many particulars of these are given in Havelock Ellis' most interesting book, "The Criminal," and to some of them we may here refer.

With regard to the brain, the results do not enable one to say that a special "criminal type" exists, but nearly all the inquirers are agreed that anatomical anomalies indicative of irregular or arrested development are of much more common occurrence than in the normal population. This has recently been well shown by the interesting study of Lattes* upon the brains of fifty criminals; whilst Kaes† found agenetic or degenerative changes in the brains of five recidivists which he examined. The same is true of the face, jaws, palate, and body generally; in the habitual criminal stigmata of degeneracy abound just as they do in the ament. The Anthropometric Committee of the British Association examined over 3,000 criminals, and found them about 2 inches shorter and 17 pounds lighter than the average English population. Baer examined 4,500 Berlin criminals, and found that the average height was decidedly below the normal, and the same was observed by Hamilton Wey in America. Dr. G. Wilson, in a paper on "The Moral Imbecility of Habitual Criminals as exemplified by Cranial Measurements,"‡ arrived at the conclusion, from measurements of the heads of 464 criminals, that habitual thieves had well-marked indications of defective cranial development associated with physical deterioration. Dr. J. Bruce Thompson,§ in a summary of his observations upon over 5,000 prisoners, pointed out the great prevalence of mental defect, especially amongst the juvenile criminals, and also the frequency with which morbid appearances were found post-mortem. Professor Lombroso, in his book "L'Uomo Delinquente," came to the conclusion, on anthropometrical grounds, that the criminal is a manifestation of degeneracy.

Similarly with mental characteristics. Although many of the criminal class appear on casual examination to be of average intellectual calibre, there is abundant evidence to show that a large number of them present anomalies similar to those referred to in our description of the Feeble Mind. As Havelock Ellis says, "On the one hand he is stupid, inexact, lacking in forethought, astoundingly

* Lattes, *Archiv. di Psychiat.*, 1907, vol. xxviii., fasc. i., ii.
† Kaes, *op. cit.*
‡ A paper read before the British Association at Exeter, 1869.
§ *Journal of Mental Science*, 1870.

imprudent; on the other hand he is cunning, hypocritical, delighting in falsehood, even for its own sake, abounding in ruses." And in another place, "The criminal in some of his most characteristic manifestations is a congenitally weak-minded person, whose abnormality, whilst by no means leaving the mental aptitudes absolutely unimpaired, chiefly affects the feelings and volition, so influencing conduct and rendering him an antisocial element in society." Dr. Maudsley,* speaking of instinctive criminals, says: "It is a matter of observation that the criminal class constitutes a degenerate or morbid variety of mankind marked by peculiarly low physical and mental characteristics;" whilst Dr. Nicholson† has also pointed out the great prevalence of weak-mindedness, with instability, tendency to delusions, insensibility, and emotional nature, in the criminal class. A similar conclusion is arrived at by Gruhle (in the work already quoted), who found that 55 per cent. of juvenile delinquents were psychically abnormal, whilst 19 per cent. of them were definitely imbecile.

Finally, the close connexion between criminals and aments is further shown by the antecedents of the two classes. In inquiring into the family histories of members of the habitual criminal class, I have often been struck by the fact that, although some of them might show little obvious indication of mental inferiority, a large number of them came of a neuropathic stock, and possessed brothers and sisters who were markedly deficient. Conversely, in examining aments, I have often found that their brothers or sisters were criminals. In dealing with the inmates of prisons it is often extremely difficult to obtain a family history, but it was ascertained that, of 233 prisoners at Auburn, New York, at least 23 per cent. were of neurotic (insane and epileptic) origin. Rossi found that in 71 criminals there were 5 insane parents, 6 insane brothers and sisters, and 14 cases of insanity amongst more distant relatives. Kolk found a morbid inheritance in 46 per cent. of criminals, and Marro in 77 per cent. Sichard, as a result of his examination of nearly 4,000 German criminals, found that there was an insane, epileptic, suicidal, or alcoholic heredity in 36·8 per cent. of incendiaries, 32 per cent. of thieves, 28·7 per cent. of sexual offenders, and 23·6 per cent. of sharpers.

Lastly, the interesting record of the Juke family, which was

* Maudsley, "Responsibility in Mental Disease," 1872.

† Nicholson, *Journal of Mental Science*, 1873-1875.

compiled by R. L. Dugdale,* well shows the close relationship existing between the criminal and the psychopath. This observer traced the descendants of one morbid couple through five generations to the number of 709 individuals, and found that whilst a small proportion were honest workers, the great majority were vagabonds, paupers, criminals, and prostitutes.

I think these facts (and I have only referred to a few of them) conclusively show that, although in a large number of habitual or instinctive criminals the defect may appear to be more moral than intellectual, nevertheless their persistent criminality in spite of punishment, as well as the many features they possess in common with the true aments, are a sufficient justification for our considering them as being closely related to, indeed actually suffering from, a mild degree of mental deficiency.

Numerical Incidence of Moral Defectives.

The number of moral defectives (within the legal meaning of the term) resident in the prisons and convict establishments of the country at any given time by no means represents the total number in existence. Many will have just been discharged and be found wandering the country; whilst others will be temporarily detained in workhouses, homes, or asylums. This makes their enumeration a very difficult matter, and it is only possible to give an approximate estimate. Answering a question in the House of Commons on July 22, 1907, the Home Secretary said: "Both in local and convict prisons those prisoners who are not certifiably insane, but are unfit through mental deficiency for the ordinary penal discipline, form a separate class and are specially treated. In the year 1906-07 the numbers were—In local prisons, 355, and in convict prisons, 107. . . . In addition to those so classified, there are other prisoners temporarily under observation to ascertain their mental state." It is obvious, however, that these figures greatly underestimate the real incidence; in fact, they refer not to mental or moral defect, but to amenability to prison discipline, which is a totally different matter. The reports of the medical investigators to the Royal Commission showed that on an average at least 10 per cent. of the prison population were defective, but this, owing to the nature of the inquiry, is probably an underestimate, and it seems likely that on the whole

* Dugdale's book is a most careful compilation, and well worthy of study. A fourth edition was published by Putnams, New York, in 1910.

the statement of Dr. Parker Wilson* with regard to Pentonville Prison is much nearer the truth, and that "there are not less than 20 per cent. of the prisoners who show signs of mental inefficiency." In the case of juvenile prisoners the proportion who are mentally defective is much higher, and Dr. Wilson found that of 389 admitted in the course of a year, 26 could neither read nor write, 328 only averaged the second standard, and 35 only could read and write well. He described as many as 40 per cent. of them as feeble-minded. It seems likely that the nearest approximation to the true incidence will be gained by approaching the question from another standpoint, and considering what proportion of the mentally defective evince pronounced criminal and antisocial tendencies. My investigations in Somersetshire showed that this proportion was 10 per cent., which corresponds to a total of about 13,000 moral defectives in England and Wales in the year 1906. The total number of persons tried for indictable offences during the preceding year was 61,463; on the assumption that 20 per cent. of these were mentally deficient, the number of these latter would be a little over 12,000. We shall, therefore, probably not be far wrong in saying that the number of persons in England and Wales coming within the legal definition of moral defect was between 12,000 and 13,000 in 1906.

Description.

In the preceding chapters of this book mental defectives have been divided into certain varieties, and the classification was largely based upon the presence of particular pathological or clinical conditions. But the outstanding feature of moral defectives, to whichever of these clinical varieties they may belong, is that of incorrigible misconduct, and if any further subclassification is to be made, it would appear most desirable that it should rest upon the presence of any peculiarities in this respect. Conduct, no doubt, is the outward and visible manifestation of certain internal brain states, and hence a psychological classification would probably be the most scientific. As we have already seen, there is every reason for thinking that psychological differences do exist: that some moral defectives, for instance, are characterized by a lack of moral sense, others by a feeble will, and others by the presence of irresistible morbid impulses. But our knowledge of the psychology

* Parker Wilson, in the Report of Royal Commission on the Feeble-minded, 1908, vol. viii., p. 123.

of this condition is so very imperfect that I feel a classification on these lines is at present hardly justifiable, and hence, whilst endeavouring to point out the mental correlation that exists, I shall confine myself to classifying these cases according to the particular features of their morbid conduct.

Considered from this point of view, I think that moral defectives may be divided into three chief varieties, as follows:

1. *The morally perverse, or habitual criminal type.*
2. *The facile type.*
3. *The explosive type.*

In addition to these, it is to be noted that criminal acts are frequently committed by aments during an attack of insanity; but as such attacks hardly come within the category we are now considering, they will be dealt with in the description of Insane Aments. The above three types will now be considered in order.

1. The Morally Perverse, or Habitual Criminal Type.

The persons comprising this group conform most strictly to the legal definition of moral defect which has been given, inasmuch as their whole lives are one long round of vice and crime, from which they are absolutely undeterred by entreaty, reason, or punishment. In my experience they commit crimes, not because they are deficient in will or are passionate and excitable, like those to be presently considered, but because they are either possessed of ineradicable antisocial propensities, or really cannot appreciate the difference between right and wrong. They are, in fact, fundamentally lacking in moral sense, and this, together with the defect of judgment which is always present, causes them to be absolutely irreformable. The condition is inborn, and consequently shows itself in the earliest years. As children they will commit acts of almost fiendish cruelty to animals and ·se younger than themselves; they will lie when the truth would answer their purpose just as well or better; they will purloin anything which comes within their reach, to destroy it or throw it away the next moment; they will break windows and crockery, set fire to hayricks, furniture, or anything that will burn, and take a malicious delight in upsetting a baby in a perambulator or pushing another child into the river; in short, they will persistently act in such a way as to be a terror to their relatives and the whole neighbourhood in which they live. In later years such

persons are guilty of the more serious crimes of incendiarism, train-wrecking, criminal assaults upon little girls, and homicide, and although these may at times appear to be sudden and unpremeditated, they very often show evidence of previous deliberation and plan, and sometimes of considerable cunning to escape detection. Their whole lives consist of an almost unbroken series of offences, in many cases there being literally scores of convictions, whilst in some they amount to hundreds; they are the definitely mentally defective habitual criminals.

At the same time it is important to remember that the intellectual impairment, as judged by the ordinary standards, may be by no means obvious. Whilst in some instances it is absolutely impossible to keep these children at school, in consequence of which they show considerable educational arrears, in others they may attain to a tolerable proficiency; and a few evince a more than average degree of acquirement in some particular direction. A certain proportion of persons of this type are markedly insensitive to pain, and such will suffer severe injuries from cuts, burns, etc., and even undergo grave surgical operations without any appearance that they feel the slightest discomfort. It might be thought that such persistent criminals as they prove themselves to be would certainly possess a degraded, criminal type of features; but although in some of them stigmata of degeneracy are present, this is by no means always the case, and not a few of them are pleasant-looking plausibly speaking persons who would seem to be absolutely incapable of committing the crimes of which they are undoubtedly guilty. Dr. Shuttleworth* mentions "three nice-looking children, sisters and brother, formerly under his care, who at times would appear models of propriety, while at others they had all the characteristics of little demons. With innocent expression they would furtively accomplish the most abominable mischief, and after meekly acknowledging the error of their ways, would emphasize their apology by a missile flung at the head of the person who had attempted to bring them to repentance." I know one boy who has not yet reached his eighth birthday, but he has already been expelled from school because nothing was safe within his reach. He has a vocabulary equal to that of any bargee, and he steals eggs, fruit, money, and anything he can lay his hands on; he has already burnt two hayricks to the ground. In an elementary

* Shuttleworth and Potts, "Mentally Deficient Children," 1910.

school of a provincial town I came across three children of this type belonging to one family. The two boys were only eight and five years old respectively, and the girl seven years; but the schoolmaster told me that they had a propensity for lying, thieving, and causing trouble generally, the like of which he had never met, and that nothing seemed to deter them. They were all mentally defective, and I was informed that the father was of the same type, and more often in than out of prison. The following cases are further examples of this class:

George P——, a mentally defective child, aged thirteen and a half years, attending school in Standard I. Power of reasoning decidedly wanting, but alert and cunning, and always getting into trouble. He is said to be incorrigibly lazy at school, and a frequent truant, and the schoolmaster says that he will steal and lie without the least compunction, and that punishment seems to be without the slightest effect. He is always ready with a plausible excuse, and shows a precocious amount of cunning in covering up his misdeeds. A short time ago he stole the schoolmistress' gold watch from its accustomed place on her desk. It was not missed until the children had left, and then there was an instant hue and cry. George, finding himself pursued, secreted the watch in a tree, and then submitted himself to be searched with an air of complete innocence. Unluckily, however, for him, the manœuvre had been seen. It is interesting to note that this boy's father is just the same (indeed, I am inclined to think that this moral perversion is often hereditary). He is plausible and cunning, and, although he occasionally does odd jobs, I was told by the police that he never did any regular work, and that the greater part of his life had been spent in prison for such offences as stealing, poaching, and drunkenness. When I saw him he had just returned from serving a term of imprisonment for poaching.

An extreme instance of this type of case which is worthy of note is related by Dr. Gray, lately physician to the Ameer of Afghanistan, and referred to by Dr. Mercier.* It is that of a man "who, after having had first his right hand, and subsequently his left hand, struck off as a punishment for theft, seized with his stumps and made off with an earthenware pot of trifling value and of no use whatever to him. The crime was witnessed and the criminal at once arrested and taken before the Ameer, who sentenced him, as

* Charles Mercier, "Criminal Responsibility," 1905.

he must have expected, to be hanged; and hanged he accordingly was." Dr. Mercier also mentions the case of a cadet at Sandhurst, who stole the boots and clothes of a comrade, although he was amply supplied by his father, and had no need of the things stolen. He stole them without any concealment, and actually wore them in the presence of their owner. He was expelled, and on his return home, although standing in awe and terror of his father, nevertheless cleared the latter's dressing-table of its ivory brushes and silver furniture, and sold them to a passer-by for five shillings.

Quite recently I was consulted with regard to an almost precisely similar case in the shape of a youth at a public school who, although liberally supplied from home, and having everything he needed, systematically purloined his companions' property of every description. This youth was by no means unintelligent; in fact, in several subjects he occupied a high place in his form, and his general appearance and conversation were so prepossessing that anyone not acquainted with the type would almost certainly feel that some horrible mistake had been made. His only observable peculiarities consisted of a somewhat wandering attention, a general restlessness, and several little tricks such as constantly putting his hand to his collar, etc. And yet, when I questioned him about his misdeeds, he acknowledged them without any shame or concealment, and I found that he had been expelled from two other schools for similar practices.

Another case which recently came under my observation is that of an exceedingly handsome young woman of good family who had been brought up amid every refinement and who lacked nothing—but moral sense. From the age of ten years she would pilfer money from her mother and the maids in the house. She was removed from school after school because she robbed the other girls, persistently lied, and spread stories without the slightest foundation. She invented and circulated stories regarding herself and young men which caused grave family scandals. She obtained large sums of money by false pretences from her relatives and friends, and on several occasions went out in the middle of the night to meet young men of notoriously bad character. At the age of twenty-two her reputation was such that it was impossible for her to remain at home, and she was boarded out under strict supervision. But she absented herself, committed misconduct with at least two men, and developed a bad attack of gonorrhœa. Every effort was made

to appeal to her sense of honour and her love for her family; but she seemed not only incapable of reforming, but to be quite insensible of the shame and disgrace she had brought upon herself and her name. She admitted to me that she saw no harm in what she had done, and affirmed that she would do the same again if she got the chance. The girl was of good birth, most prepossessing appearance, and might undoubtedly have made a good match and enjoyed a high social position, and the sacrifice of these can only be looked upon as indicative of some mental deficiency; but I must confess that no other defect was ascertainable beyond the inference of defective judgment to be drawn from her persistent misconduct, and it might on that account readily be held that she was uncertifiable under the present legal definition of moral defect.

Finally, as further examples of this type of morally defective person, I may refer to the following three cases culled from the newspapers during the past few years, all of which were reported to be mentally defective.

"*W. K.*, a ten-year-old boy, was charged at Bow Street with attempted pocket-picking in a railway-train. The boy excused himself by saying that his mother had pushed him into the train with orders to rob the lady. The police found that there was not a tittle of evidence to support the lad's statement, and an officer from the school-board reported that he was mentally defective."

"*T. P.*—Owing to the extraordinary series of grave outrages committed in Nottinghamshire and the immediate district during the past month, much importance was attached to a case which occupied the attention of the Mansfield Bench. The man in custody, a labourer named *T. P.*, aged twenty-three, a ***deaf-mute of weak intellect***, was charged with feloniously placing a wooden gate on the Great Central line at Kirkby-in-Ashfield. *P.* has been in the habit of sleeping out, although his reputed place of abode is at Sutton-in-Ashfield, within which area there have been a number of abortive attempts at train-wrecking. In addition, the neighbouring parish churches of Kirkby and Annesley have been destroyed by fire upon successive nights, both disasters being the work of an incendiary. Prisoner was apprehended in a shed at some brickworks. He showed the police-officers a spot on the railway where he said he placed a wooden gate on the rails. Dr. Gray, who had examined prisoner, gave evidence that *P.* was a lunatic and a proper person to be taken charge of. Deputy-Chief-Constable Harrop said, as

accused was certified insane, no evidence would be offered. The man was first arrested in connexion with a robbery at Ulfreton railway-station, and the proceeds were found in his possession; other robberies on the railway had been also traced to him. Prisoner took witness and Police-Constable Fryer to Sutton-in-Ashfield, and across some fields to the Great Central Railway at Kirkby, where he pointed out the exact spot at which an obstruction had been placed on the line. He exhibited great satisfaction when a train approached, and showed where he had obtained the gate and had hidden himself until a train dashed into the obstruction. Afterwards prisoner showed exactly where two pairs of trolly-wheels and a wheelbarrow attached had been placed on the line. Accused was ordered to be sent to a lunatic asylum."

"An extraordinary story was told at Waltham Abbey Police Court yesterday morning, when *F. C. R.*, a boy ten years old, was charged with being beyond the control of his parents. The boy's mother said that he had torn tiles from the roof of the house, smashed most of the windows, and wrecked the greenhouse with bricks. He had drenched his invalid father with water as he sat helpless in his chair, and had thrown bricks at him. The boy had threatened to stab the witness and a woman who worked for her, with a knife. He had climbed to the roofs of outhouses, wrenched off tiles and thrown them at her. He had stolen money from her purse, and his language was so dreadful that neighbours had to close doors and windows to avoid hearing it. Police-Sergeant Maher said that the boy had made Chingford Road horrible by his language. Witness had seen the parents' house, which was a perfect wreck on account of the boy's depred- ns. He produced two half-bricks which the boy had thrown a ther. The Bench remanded the lad to the workhouse with a to his comm. l to an industrial school."

2. The Facile Type.

In this type of morally defective person the commission of crimes and acts of immorality does not appear to be so much due to any want of appreciation of the difference between right and wrong, or to any pronounced criminal propensities, as to the fact that the individuals are so lacking in will power as to be unable to steer a right course against resistance; they must go with the stream, and hence the extent of their criminality is dependent upon the nature

of their environment. If this is good, they may lead placid, contented, harmless lives, and these persons are usually obedient, well-behaved, and industrious workers under the supervision of an institution, and they are readily amenable to the discipline of prison life. Amid bad surroundings, however, they readily succumb to the wiles of the vicious, and become the dupes and tools of the evil-disposed; and under these circumstances may be led to commit very serious ences. Perhaps, strictly speaking, they should hardly be regarded as *morally* defective, since their chief defect is a mental one, but since their facile disposition so readily predisposes them to crime, they comprise a variety of defective criminals.

These persons, unlike the class we have just referred to, do not commonly cause much trouble until adolescence is reached, although instances occur in which even as children they have been instigated to the commission of offences by their companions. With the appearance of adolescence, however, and the consequent diminution of parental restraint, their facility soon makes itself manifest, with the result that they are speedily in trouble.

I am disposed to think that the majority of this type are females, and the first lapse is usually in a sexual direction. I have met with not a few instances where a feeble-minded girl of this kind, of gentle birth, has, before the age of maturity, given birth to an illegitimate child; whilst in the working classes such an occurrence is exceedingly common. My experience is that about half the girls admitted into Magdalen Homes on account of a "first fall," or of the extreme probability of such happening, are of this facile feeble-minded type, and it is likely that a considerable proportion of prostitutes belong to the same class. But the class is by no means composed entirely of females, and there are not a few mentally defective youths of the same facile disposition who readily drift into a life of persistent crime in the absence of adequate supervision. In former days there can be no doubt that such persons were frequently utilized as catspaws by professional criminals of stronger intellect, and although it is likely that the number of persons so made use of has considerably diminished during recent years, our police courts show that even to-day such feeble-minded dupes are by no means unknown.

The following are illustrative cases:

Rose T——, a well-grown, pleasant-featured girl of twenty years. She left school at the age of fifteen, but was only in the second

standard, and was always regarded as "not exactly." On the whole her conduct at school was good, but the schoolmistress said she seemed very weak-willed and was readily persuaded to do silly things by children much younger than herself. At the age of seventeen she was admitted into a rescue home in a pregnant condition, and it appeared that for months past she had been walking out at night with most of the boys of the village in turn. After her confinement she was placed in a training home, and proved herself such a cheerful, willing worker that in a short period a place in service was found for her. Unfortunately she seems to have got into bad company during her evenings out, and she was discharged from her situation in consequence of returning very late one night in a state of intoxication. Upon leaving she seems to have been persuaded by her companions to take lodgings with them, and she was soon fully embarked upon a career of prostitution and crime. She was repeatedly in the hands of the police for drunkenness and using obscene language, and on several occasions served short terms of imprisonment for petty larceny. The police were of opinion that she was simply a tool in the hands of the female with whom she lodged, and that the latter lived upon her pickings and stealings and immoral earnings; but this woman was too astute to be caught. When I examined this girl she was obviously very weak-willed, irresponsible, and amenable to almost any suggestion; her judgment was feeble, and her ideas, speech, and general appearance childish; but it is quite likely that many magistrates would doubt whether there was sufficient evidence of permanent mental defect to justify her certification as a moral imbecile under the Act.

George A——, a feeble-minded, undersized youth with a slouching walk, furtive demeanour, and physiognomy typical of mental defect. He answers questions in a simple, childish manner, and gives information regarding his past life willingly and without any appearance of shame or concern; his memory, however, is a little defective, and his account is at times confused and incoherent. He cannot read, write, or sum, but he is quite capable of useful work under supervision, and his conduct in prison (where I saw him) is good. The youth knows nothing about his parents, and little about his early life beyond the fact that he was brought up in an industrial school, and thence put to work on a farm. He ran away because he wanted a change, and, after tramping about for a time, eventually got employment on another farm. He ran away from here because

he was discovered committing acts of indecency with the cattle. He then tramped about, and was frequently in and out of workhouses. He was convicted with several others of stealing lead, and served a term of imprisonment. After this he again tramped the country, spending most of his time between the prison and the workhouse. He is now in for setting fire to a rick, for which act he is unable to give any reason beyond that he was told to do it by some people he met (tramps) on the road.

3. The Explosive Type.

I have termed this the "explosive type" for the reason that when misconduct occurs it is of the nature of a sudden, violent storm closely resembling the motor convulsions of an epileptic. There is no defective appreciation of right and wrong; indeed, these persons often manifest contrition at the acts they have committed. The wrongdoing seems to be simply the result of a sudden impulse which they are unable to resist. It is probable that this results partly from a lack of inhibition and partly from a hypersensitivity, whereby certain feelings and ideas rapidly develop a dominating force. However this may be, the sudden violence of the acts, without any premeditation, indicates the sudden, excessive, temporary liberation of nervous energy very similar to that occurring in epilepsy, and the cases may well be looked upon as examples of psychic epilepsy. There is a further resemblance in that, like many of the ordinary epileptics, these persons are often extremely obstinate, intolerant of contradiction, and inclined to be very suspicious; whilst their mental constitution is so unstable that they will often suddenly pass from a state of what appears to be perfect calm and indifference to one of raving, uncontrollable fury. At the same time ordinary epileptic fits are not common in the class.

It is obvious that aments of this unstable type are extremely untrustworthy and dangerous, and they consequently comprise a considerable proportion of those mental defectives who commit criminal acts. Their instability will usually have been evident from childhood, although in a few cases it may not attract marked attention until puberty or adolescence is reached. Their misconduct is undeterred by punishment, which indeed often only makes them morose and more intractable, and this, together with their intel-

lectual defect, brings them within the legal definition of moral defect which has been quoted. The character of their offences varies very considerably. In their ordinary moments their instability makes them prone to commit acts of destruction, to fighting, brawling, and disorderly conduct; whilst in their paroxysms there is hardly any crime of which they may not be capable. Feeble-minded persons in general are very intolerant of alcohol, but its effects seem to be especially marked upon the type we are now considering. I remember one youth in a country village who used to be repeatedly plied with cider by the yokels of the place in order that they might be amused by his furious excitement, pretty much in the same way as a bull is baited in the ring. The following are examples of the type:

Thomas B——, a feeble-minded young man, twenty-five years of age, with numerous stigmata of degeneracy. He could never learn at school, and afterwards could not keep his situations. At the age of twenty-three he became insane, and was sent to the asylum for six months. Shortly after discharge he was apprehended for sleeping out, and served seven days' imprisonment. He had only been out a few weeks when he attempted rape on a small girl whom he met in the road. For this he was sentenced to two months' hard labour. On being liberated he became very violent and aggressive, and threatened to cut his mother's throat. He was again sent to the asylum, and discharged in six months. He is now living at home, and works occasionally in the factory; but his mother says that he cannot be depended upon, that some days he refuses to get out of bed, and is at times so violent that she is afraid to have him in the house. He is a powerful fellow, who should be capable of hard work could he be controlled.

Alfred L——, a feeble-minded man of twenty-eight years. He is now occupied cracking stones, and does occasional work on farms when he can get it; but he is very unstable, at times being noisy, excitable, quarrelsome, and absolutely refusing to do any work. He has been imprisoned at least six times for such offences as drunkenness, fighting, stealing, and setting fire to gorse, and is known and dreaded for miles round as a regular nuisance.

H. A., a feeble-minded deaf-mute, was charged with stabbing his sister. The prosecutrix said that he had never been quite right in his mind, and that she had always treated him as a child, but that he was no trouble if he did not get into drink. The medical

officer of the prison certified him as being of weak mind and likely to be easily affected by drink, but he could not certify him as insane. The charge was reduced to one of common assault, and the magistrate "thought it would be good for the youth to go to prison, and committed him for two months"!

I have no personal knowledge of the following case, but as it seems undoubtedly to come within the class we are now considering, and to be of a somewhat extraordinary nature, it seems worthy of mention in this place:*

"Six murders at the age of thirteen is the remarkable record claimed by Ida Schnell, whose case is at present being investigated at Munich. The girl had been in service with a number of different families as nursemaid, and no suspicion seems to have arisen against her till after the sixth infant entrusted to her care had died a sudden and mysterious death. Even then it was only after the baby had been buried that it appears to have struck anyone that there was something sinister in the circumstance that her nursing had been associated with mortality of so remarkable a character. It was finally decided to exhume the body of the last of her charges, the fourteen-day-old son of a peasant proprietor of Ampermoching, near Munich. The corpse was taken from the coffin yesterday afternoon, and examination showed that death had been caused by perforation of the yet soft infantile skull with some sharp instrument. Schnell was at once arrested and closely questioned. At first she strenuously denied having caused the child's death and protested that she had much too gentle a nature to harm the infant in any way. Under cross-examination, however, she broke down, and admitted that she had killed not only the baby whose body had been exhumed, but four others for whom she had been engaged as nurse. She confessed further that she had taken the lives of these infants by plunging a hairpin into the lower part of the back of their heads till they ceased to cry. Asked as to her motive, the girl said that the crying of the infants roused in her unconquerable revulsion, and excited her to such a degree that she lost all control over herself, and would do anything to make them quiet. This morning she confessed to the sixth murder. The parents of one of her victims reside in Munich itself, the others in small places in the vicinity. Schnell, who will be fourteen next month, is physically well developed for her age, but rather dull-witted. Her father is dead, but

* Verbatim from the *Daily Telegraph*, October 18, 1907.

she has a stepfather, who is a day 'abourer at Schleissheim, to the north of Munich. Her series of murders was only rendered possible by the fact, which will be a revelation to many, that in Bavaria death certificates are frequently, and in the country districts always, granted by laymen. It is said that a doctor would at once have noticed the wounds caused by the hairpin."

Other Criminal Aments.—Hitherto we have considered only those cases of mental defect which are accompanied by such persistent vice and criminal conduct as to bring the persons within the legal definition of moral imbecility, or, as I prefer to call it, moral defect. It is necessary to point out, however, that these are by no means the only criminal aments. Mentally defective persons may, and frequently do, commit serious offences during an attack of insanity, and cases of this kind will be described in the chapter dealing with Insane Aments. Also many aments who are neither insane nor possess vicious or criminal propensities may be guilty of occasional crimes of a very serious nature. Thus, a feeble-minded young man of nineteen years attempted to wreck a train by placing a large coil of electric wire on the line. No motive whatever could be assigned for the act. A feeble-minded girl aged seventeen, living in a small village, was frequently jeered at by the boys of the place. One day she called one of them to her, and told him to shut his eyes and open his mouth and see what the King would send him. He did so, and the girl promptly drew a razor across his throat, partially severing his windpipe. Another feeble-minded boy of sixteen years drowned a child of three by pushing him into a dyke. Such examples might be multiplied almost indefinitely, but they serve to show that the irresponsibility and lack of judgment which is such a characteristic of aments may readily cause them to commit serious crimes even in the absence of persistent vicious propensities.

This brings us to the consideration of the important question of

The Criminal Responsibility of Aments.

The law of England has long recognized that persons suffering from certain forms of mental disease should not be held accountable for their actions, and into this category come idiots and pronounced imbeciles, or any person who, in the words of Mr. Justice Tracey (1723), knows what he is doing "no more than an infant, a brute, or a wild beast." By the provisions of the Mental Deficiency Act it would appear that a similar protection is now afforded to any

mentally defective person, since it is laid down that a defective person found guilty of any criminal offence may be dealt with under the Act by being sent to an institution for defectives instead of to a penal establishment. The use of the word *may*, and not *shall*, however, still leaves his position somewhat ambiguous and in the hands of the judge, so that the criminal responsibility of aments, as well as of the insane, can by no means be said to be clearly defined. There are certain precedents and rulings which are usually followed in such cases, but in any particular instance the fact of the responsibility or otherwise of the accused is a question for the jury to decide upon the evidence presented to them. Criminal offences in which this question of responsibility is raised are exceedingly common, and it is plainly the duty of the members of our profession, who alone can form a correct estimate as to the extent to which conduct is likely to be influenced by mental deficiency or disease, to formulate general principles, and to give their opinion regarding the mental condition of any particular accused person in order that the jury may arrive at the decision. These general principles, however, must be just, and whilst protecting those who are really irresponsible from undeserved punishment, they must also protect society against the escape from punishment of those who, even if mentally deficient, are rightly accountable for their actions.

The rulings of English Courts at the present time are generally based upon the replies of the fifteen Judges to the House of Lords in the middle of the last century. Briefly, it may be stated that for an accused person to be held irresponsible on the ground of insanity, it must be shown that he was of diseased mind, and that at the time he committed the act he was not conscious of right or wrong, or was under some delusion which made him regard the act as right.

This dictum, it will be observed, takes no account of the question of defective control, an omission which was pointed out in the exhaustive treatise of Sir FitzJames Stephen. According to this eminent jurist, "No act is a crime if the person who does it is, at the time when it is done, *prevented from controlling his own conduct* unless the absence of the power of control has been produced by his own default." I do not propose to enter into any discussion regarding the diminution of the will in ordinary persons or even in insanity; but I am quite certain that in persons suffering from amentia a diminished power of control is so commonly presen

and such an essential part of their mental condition, that a grave injustice may be done if this be not taken into account. There *may* be non-defective persons who, whilst fully appreciating the nature and consequences of certain criminal acts, are yet incapable of refraining from committing them, and such cases are described as impulsive insanity. But it cannot be doubted that there *are* aments who suffer from a definite defect of control which leads them to commit criminal acts. I would therefore say that, whilst the mentally deficient person is not necessarily irresponsible for any crime he may commit, he should certainly be held unaccountable when he commits an act (1) of which he does not understand the nature or that it is contrary to law; (2) which is the result of an impulse he was unable to control; (3) which is the natural result of a delusion of which he is shown to be the subject.

With regard to these particular qualifying conditions a few words may be said. (1) *Want of knowledge* as to the nature or illegality of the act would usually be capable of ready demonstration in the case of idiots and imbeciles; but even in the milder grades defective intelligence or education might still result in ignorance as to *how* wrong the act was or that it was forbidden by law. As was ably pointed out by Sir FitzJames Stephen: "Knowledge has its degrees like everything else, and implies something more real and more closely connected with conduct than the half knowledge retained in dreams." As an instance this author quotes the extreme case of the idiot who cut off the head of a man whom he found asleep, remarking that it would be great fun to see him look for it when he woke; and he adds: "Nothing is more probable than that the idiot would know that people in authority would not approve of this, that it was wrong in the sense in which it is wrong in a child not to learn its lesson, and he obviously knew that it was a mischievous trick." And it cannot be doubted that the same kind of incomplete knowledge as to *how* wrong an act is exists in the case of many persons suffering from a mild degree of mental deficiency. The high-grade ament at Earlswood Asylum, who has been mentioned as attempting the destruction of an official who had displeased him, undoubtedly knew that in so doing he was doing what was wrong, but I do not for one moment think that he appreciated how wrong his act was, or that, had it succeeded, he could justly have been held *fully* accountable for it. Dr. Mercier,* commenting on this

* C. Mercier, "Criminal Responsibility," 1905.

question in his recent philosophical treatise, says: "It is a truth on which I have insisted in season and out of season for many years, that a man may know that his act is wrong without knowing how wrong it is." This defective appreciation of the wrongness of an act is the distinguishing feature of those aments lacking in moral sense.

(2) Pronounced *defect of control* in aments is usually clearly evident from infancy, although in some cases it may not attract attention until puberty. It is one of the chief characteristics of the "facile" and "impulsive" types of amentia, and of some of the epileptics. It may also be a prominent feature in some of those persons we have described as the "morally perverse" or "habitual criminal" type, who repeatedly (and often openly) commit offences absolutely undeterred by punishment.

I am inclined to think that in some of the milder cases of this kind improvement may take place under suitable training, and that some degree of control may be developed; but pronounced cases are practically hopeless, and although it may be extremely difficult in some of them to detect any intellectual deficiency, the commission of such senseless depredations in spite of punishment clearly points to the presence of a disorder of mind. On the other hand, there can be no doubt that "moral deficiency" and "defective will," or as they are sometimes more euphemistically described, "kleptomania," are often put forward as a defence when the individual is fully accountable for his actions. Personally I should be very loath to admit defective will-power as an excuse for a criminal offence unless the accused were of one of the types which have been described, or there were evidence of the previous commission of impulsive acts.

(3) The commission of criminal acts in consequence of *delusions* practically only occurs in the case of aments who are also insane. These will be described in the following chapter, but here it may be stated that, although the combination of insanity and mental deficiency would raise a strong presumption as to the irresponsibility of the individual so affected, he could only justly and logically be held unaccountable for the commission of a criminal act when it was clearly shown that his delusion or mental disease did, in fact, prevent him from knowing the nature and quality of the act at the time it was done, or from controlling his own conduct, or caused him to think that the act was right. For as Mr. Justice Stephen said:

" An act may be a crime although the mind of the person who does it is affected by disease, if such disease does not, in fact, produce upon his mind one or other of the effects above mentioned in reference to that act."

It is thus seen that, although an inquiry into the criminal responsibility of a person must, of necessity, take into account the state of that person's mind, yet the question is not in reality a medical, but a legal one. It is the duty of the physician to place before the court full and impartial evidence regarding the presence or absence of such mental disease, disorder, or deficiency as would influence conduct; but it is the duty of the judge and jury to decide whether this defect or disease *has* so influenced conduct as to render the accused partially or wholly irresponsible for his act.

In defining the " conditions of responsibility," Dr. Mercier arrives at the conclusion that " to incur responsibility by a harmful act, the actor must *will* the act; *intend* the harm; *desire* primarily his own gratification. Furthermore the act must be *unprovoked* (*i.e.*, without *adequate* provocation), and the actor must *know* and appreciate the circumstances in which the act is done."

With regard to **civil incapacity,** an idiot has no civil rights, while a person suffering from feeble-mindedness can be adjudged incapable of managing his affairs by proceedings in Chancery. In such a case trustees of the estate might be appointed without depriving the person of his liberty; in other words, he might be declared incapable of managing his affairs, but capable of managing himself. Under the Mental Deficiency Act of 1913, the administration of the estate of a defective person placed in an institution or under guardianship is subject to similar provisions as in the case of a lunatic lawfully detained but not found so by inquisition.

An idiot is inadmissible as a witness, but in the case of an imbecile or feeble-minded person it is for the Judge to examine and ascertain whether he is of competent understanding to give evidence, and is aware of the nature and obligation of an oath; if satisfied that he is, the Judge will probably allow him to be sworn and examined.

CHAPTER XVI

INSANE AMENTS

In the literal sense of the word "insanity," all aments may be looked upon, and are often described, as "congenitally insane." But nowadays there is a tendency to restrict the term to those cases in which there is a perversion of the *ego*, and it is in this sense that it is here used. Sir George Savage says a man must be considered as sane or insane *in relation to himself*, and although such a definition would render "congenital" insanity an impossibility, the variations of mental function and capacity in the mentally deficient are so great that, from the standpoint of amentia, there is much to be said in favour of using the *ego* rather than the "normal" or "mean average" as a standard of reference.

A large number of aments react to their environment in a perfectly consistent, uniform, and, as far as their mental capacity will admit, normal manner, and such may be considered sane, albeit defective. On the other hand, a certain number are characterized by lapses from their ordinary mental state of such intensity that, for the time being, they may rightly be termed insane; it is with these latter that this chapter deals.

The causes of insanity are twofold, namely—predisposing and determining. Those which actually *determine* insanity are many and varied, ranging from a slight alteration of the general bodily health and condition to a sudden strain or prolonged mental or nervous stress. As Dr. Mercier says, however, "a jerry-built villa is liable to be blown down by a storm of wind, but nothing short of an earthquake will destroy a well-constructed mansion." And in the great majority of cases of insanity there is a *predisposing* cause —namely, an instability of nervous tissue. This instability may be congenital or acquired, generally the former, and, in view of the defective structure which is the essential basis of amentia, one

would expect that in many of these persons there would be a decided nervous instability and imperfect capacity of resistance with consequent proneness to insanity; this is found to be the case.

It is probable that the actual number of aments who are thus predisposed to insanity is incapable of determination, just as it is impossible to calculate the proportion of potential lunatics in the non-defective population; but an approximate estimate of the number of the feeble-minded grade of aments who are *actually* insane can be made, and a comparison of this with the number of the ordinary insane will give an idea of the relative predisposition in the two classes.

From information which has been very courteously placed at my disposal by some asylum physicians, as well as from my own observations in the asylums of the London County Council and elsewhere, I am of opinion that at least 5 per cent. of the inmates of the county and borough asylums of this country are *feeble-minded insane;* we may therefore estimate the number of feeble-minded certified lunatics as approximately 4,450, or about 8 per cent. of the total feeble-minded of the country (54,114).

The proportion of ordinary or non-defective insane to the total population is only about 0·3 per cent., from which it appears that the predisposition to insanity in the feeble-minded is twenty-six times that of the ordinary population. There are, of course, many of the non-defective insane who are not certified, but so there are of the mentally deficient insane, and I think that these figures express the relative predisposition to insanity which exists in the two classes with tolerable accuracy. On the whole I believe we may say that quite 10 per cent. of the feeble-minded have a definite insane predisposition. With regard to this tendency in imbeciles and idiots, I am unable to give any figures, but my impression is that, although it is considerably less than in the merely feeble-minded, it is still much greater than in the ordinary population.

There is no doubt that a considerable number of the non-defective insane manifest signs of a diminished power of will or other failing from a very early age, and some writers would go so far as to include these with the aments proper.* It cannot be denied that there is much to be said for such a view, for these persons often present a physiognomy, and also stigmata of degeneracy, identical with

* See Bolton, "Amentia and Dementia," *Journal of Mental Science*, 1907.

those existing in the mentally defective. I doubt, however, whether these should really be classed as aments, although they are undoubtedly on the borderland between this condition and insanity, between a brain which is the seat of an actual arrest of anatomical structure and one which is merely unstable and of defective physiological potentiality. They serve to show that, just as the three grades of amentia merge into one another, so in turn do the mildest members of the aments stand in extremely close relationship to the insane—that idiocy is, indeed, the culmination of the neuropathic diathesis. In this place, however, I shall use the term "amentia" in the manner in which it has all along been used, and shall only refer to those persons who show definite intellectual deficiency.

In a certain number of these aments who become insane there are determining factors, just as in the ordinary lunatics; but, on the whole, these factors are much less in evidence, and as we proceed down the scale of mental deficiency they become still less and less frequent. In the imbeciles an attack of insanity may suddenly appear without any apparent determining cause whatever, and the sudden and violent storms of the idiot, which must be looked upon as of precisely the same nature as true insanity, are similarly unrelated to any obvious cause. During these attacks the child or youth will rush about, making hideous noises, overturning or smashing everything in his way, animate as well as inanimate, and often dashing himself with great violence against walls, doors, and pieces of furniture which he cannot displace. Such attacks are liable to recur with more or less constant regularity, although each is of comparatively short duration. The extreme mental instability present in these persons must be considered as of itself sufficient to determine the attack: the "jerry-built villa" topples over, not even by reason of any storm of wind, but solely because of its own unstable equilibrium.

In those aments who develop insanity this instability is usually present and recognizable from childhood. As a boy or girl the patient has been subject to fits of irritability, moroseness, or bad temper, often accompanied by acts of violence, which have been a cause not only of sorrow, but of anxiety, to friends and relations; and although these conditions can hardly be termed insanity, they are the shadows of the coming event, being evidence of that special predisposition which will almost inevitably, sooner or later, terminate in insanity. It is possible that, could the youth and adoles-

cence of a feeble-minded person of this class be passed in a perfectly orderly and routine manner, away from the bustle of the outside world, the attack might be long deferred, or even prevented. In the majority of cases, however, the first attack makes its appearance between the periods of puberty and adolescence, and in some cases even much earlier than this.

One of the most frequent exciting causes in the mild aments is alcohol, to the action of which the mentally defective, and, indeed, neuropaths generally, seem to be peculiarly susceptible and particularly intolerant. A severe fright may likewise precipitate an attack of insanity in one of these persons. I remember a mentally defective child who, for some breach of school discipline, was shut up by the teacher in a small dark room, little better than a cupboard. When taken out he was silent, and apparently dazed. The teacher said he was sulky, but he continued moody and depressed, and a few days afterwards passed into a state of profound melancholia which necessitated his removal to an asylum. Religious or other forms of excitement may also act as determining causes. One small boy of twelve years became acutely maniacal as the result of the popular excitement attending the relief of Mafeking. Another mentally defective youth in the employ of an Evangelical clergyman was so worried about his soul by this zealous but indiscreet gentleman that he attempted suicide. Another feeble-minded young man became insane in consequence of the repeated theatre-going and sight-seeing provided by his relations with the idea of amusing him. In fact, almost any trifling occurrence, which would have no effect upon the mind of a healthy person, seems to be enough to upset the equilibrium of these mentally unstable defectives, and often merely the physiological changes attending puberty or adolescence are sufficient.

I have already remarked that insanity is commoner in the milder than in the more severe grades of amentia, and in the latter it also tends to be of a somewhat different type to that in the feeble-minded, being usually an emotional storm of comparatively short duration. The insanity of the feeble-minded and high-grade imbeciles does not, on the whole, differ from that occurring in ordinary persons, and to give some idea of the relative frequency of the different clinical types, I may state that in 62 of these cases which I had under my observation for a considerable period, *mania* was present in 32, *melancholia* in 16, *alternating mania and melan-*

cholia in 6, *stupor* in 1, *delusional insanity* in 1, and *juvenile general paralysis* in 6. I doubt whether the relative incidence of juvenile general paralysis is really so great as would appear from these figures; since it is probable that the helpless, demented condition of these persons leads to the committal of an undue proportion of them to asylum care.

We may now briefly refer to the chief clinical types of insanity met with in the mentally defective.

Mania.—The attacks as a rule present the ordinary characteristics of acute mania, the patients gesticulating, shouting, singing, and rushing about for days together without cessation. Sometimes they are exceedingly violent, using abominable language, and smashing everything within reach, so that confinement to the padded room is necessary. One girl of fourteen years attacked her brothers and sister with a poker and table-knives; whilst another, aged sixteen, stabbed her grandmother and attempted to set fire to the house. One of these patients, who was recovering, accounted for his actions by saying that he "got some thought on his mind, which he tried to get off and couldn't; this caused the blood to rush to his head, and sent it rushing down his arms and legs." I am of opinion that a certain proportion of feeble-minded criminals are of this type, and that their offences are often committed whilst they are actually insane. In many cases well-marked aural or visual hallucinations occur; whilst a majority of them suffer from delusions, chiefly relating to the identity of other patients or of those about them. The following are illustrative cases:

Charles H. C——, a feeble-minded youth with several well-marked stigmata of degeneracy; said to have always been very excitable; no regular employment. Admitted to the asylum, aged sixteen, with acute mania of three weeks' duration. He had suddenly become noisy and sleepless, throwing himself into strange attitudes, utterly irrational in his conversation, shouting out "God save the Queen," and asking to be allowed to fight the Boers. Alternating with this he was tearful and anxious, with delusions of being constantly followed by policemen, and by boys who called "Thief!" after him. He was in a state of restless agitation, begging for the door to be kept locked. For a week after admission to the asylum he remained in this excited condition day and night, and it was quite impossible to control him. He was terrified of the other patients, thinking they were all trying to strangle him. After a

CRIMINAL AMENT.

FIG. 60.—A feeble-minded youth of the criminal type. Restless, idle, untruthful, and of roving disposition.

INSANE AMENT.

FIG. 61.—A feeble-minded man suffering from pronounced mental instability. Has had several attacks of religious mania.

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week he gradually became quieter, and at the end of two months had become so quiet and well-behaved that he was discharged.

A. C., male, aged twenty-five years. Has always been backward, and never learnt to read or write. After leaving school earned a few shillings weekly by doing odd jobs, but had no regular employment. Apt to behave queerly at times from early boyhood, and on several occasions disappeared from home for two or three days. At the age of twenty-four began to attend music-halls frequently, and shortly afterwards became exceedingly strange in his manner; he refused to do any work, and spent most of his time standing at the open window talking to people he imagined he saw. Much of his conversation was about one "Flo Arnold," whom he wished to marry, for which purpose he said he had taken £2 out of the bank. He gradually became quarrelsome, and finally violent and acutely maniacal, and had to be sent to the asylum. This condition of mania, with delusions and aural hallucinations, lasted for two months, after which he became quieter. He has now been in the asylum for nearly two years. He is subject from time to time to sudden outbursts of maniacal excitement, lasting from a few hours to several days; these are probably due to delusions, although none can be ascertained. He shows indications of the onset of dementia.

A. F., female. "Always simple from quite a child." Left school aged twelve, being only in second standard; afterwards in a training home; very bad-tempered and addicted to smashing windows; sent home after three years, as they found they could do nothing with her. At the age of sixteen she became so violent that she had to be removed to the asylum, having previously hurled a cooper's hammer at a man and thrown a heavy padlock at a woman. She remained in a condition of maniacal excitement for three months, with an occasional short interval of comparative calm. During one of these I asked her why she behaved so violently; she said something came over her and she felt she "must do it." In the next three months she became much quieter, and for the following five months she remained silent and gloomy, refusing to have anything to do with the other patients; then she relapsed into a state of restless excitement lasting for a month, followed by another period of depression. She is now nineteen years of age, having been in the asylum three years. She is at times fairly quiet and does a little ward work, but is very untrust-

worthy, and liable to sudden outbursts of maniacal excitement with destructiveness; she is highly emotional and unstable, bursting into fits of tears or laughter without any apparent cause. There are no indications of dementia.

R. D., female. Very backward at school; left aged thirteen and went to service, but was so liable to what her mother calls "fits of temper" that she could not keep any situation more than a few months; altogether she had fourteen situations in less than three years. At the age of sixteen she became so violent that she was sent to the asylum. On admission she was in a state of acute mania, screaming, shouting, singing, and resisting all attempts to keep her in bed; she also threatened to cut her throat. This condition lasted for a few days after admission; she then became quieter, and by the end of a fortnight was doing some work in the wards. Within a month she had a relapse exactly similar to the first attack. She is now twenty years of age, and has been in the asylum four years. At times she is quiet, well-behaved, and answers questions readily and pleasantly; it is, however, quite impossible to depend upon her, and she is subject from time to time to sudden outbreaks of excitement, in which she becomes most abusive, uses the foulest language, and violently attacks anyone who may be in her way. These outbursts last for three or four days and nights; as a rule they seem to be purely emotional storms, but in some of them delusions are present, generally to the effect that the medical officers and the nurses are trying to cut off her head or to torture her in various ways.

E. S., female. Simple-minded from birth; did not get on at school; subsequently kept at home to help mother, "as she did not seem to have enough sense to go out to work"; was at times very troublesome, and caused much annoyance by suddenly rushing into the neighbours' houses. At the age of sixteen became so restless and excitable that they could do nothing with her, and sent her to the asylum. The medical certificate states "she exhibits undue mental excitement, talks, sings, shouts, and laughs immoderately and behaves in an insane manner; very restless, imagines the attendants to be her former school-teachers, and seems altogether too excited to control herself and talk sensibly." This acute condition gradually abated, and by the end of three months she had become quiet and able to do work; two months later she relapsed, again becoming excited, noisy, and destructive day and night, in which

FIG. 63.—Feeble-mindedness, with insanity and criminal tendencies.

FIG. 62.—A feeble-minded youth suffering from chronic mania and epilepsy.

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state she remained for three weeks, then becoming quiet and industrious again. She has now been in the asylum seven years, has ceased to do any work, and is subject to frequent acute outbreaks of noisy aggressiveness. In some of these attacks delusions are present; thus, a short time ago she stated that she had given birth to a child, which had been stolen from her in the night. She is very impulsive, and on one occasion, seeing a pail of water standing in the ward, she suddenly plunged her head into it. She is becoming very untidy in her dress and personal appearance, though there are as yet no other indications of dementia.

C. R., female imbecile. Never passed first standard at school; subsequently kept at home; could never be depended upon; and from nine years of age has been at times very violent and addicted to using disgusting language. She had to be sent to the asylum at the age of fourteen, and on admission was in a state of mania, chattering to herself and singing or shouting the whole day. At times destructive and aggressive; very restless at night. She has now been in the asylum for six months, and on the whole there is very little improvement. She is occasionally fairly quiet and rational, but as a rule she is raging up and down the wards singing, shouting, and swearing at the other patients. The charge-nurse says she is her most troublesome patient.

Melancholia.—Both active and passive varieties of melancholia occur in aments, and the majority of cases are accompanied by definite delusions or hallucinations. Refusal of food is common, and threats or attempts at suicide occur in a considerable number of these patients. Active melancholia is commonly preceded or accompanied by terrifying delusions. Thus, one young girl was frightened by seeing a fight in the street; she became timid and anxious, and in a few days developed pronounced delusions to the effect that people were trying to kill and burn her. She heard voices threatening her, thought that her food was poisoned, and refused to eat it, and, in fact, became apprehensive of harm from every imaginable quarter. She was in a restless state of tearful agitation, constantly wringing her hands, and muttering, "What are they going to do to me?" Another boy had the curious delusion that he had fallen to pieces and lost some of his parts. The passive form of melancholia of these persons seems at times to be the outcome of a morbid consciousness that they are not quite as other people. They feel neglected, or, as they sometimes say, "of

use." The rebuke or sharp word of employer or parent is keenly felt, and they acquire a habit of brooding over their fancied wrongs. It is very common to hear feeble-minded persons in this frame of mind complain that they have "not had fair play." Pronounced delusions of persecution soon follow, and these pass into a state of apathetic melancholia. If they can be got to converse at all, their remarks will often be to the effect that they are "tired of life and want to die," and, indeed, attempts at suicide are by no means uncommon. These attempts are often real and definite efforts to put an end to existence, and drowning seems to be the method which most appeals to them. Many of these patients become utterly careless of personal cleanliness, refuse to work, dress, or take food, and sometimes resist any attempt on the part of their attendants to see to these matters for them.

Stupor.—This, apparently, is not very common in the feeble-minded, but I have seen one well-marked case which, beginning as passive melancholia, with visual hallucinations and refusal of food, gradually developed into a condition of complete stupor—indeed, almost catalepsy. The patient was a mentally defective boy of fifteen years, and for weeks he sat in one place, staring vacantly in front of him, dribbling from his mouth, requiring to be fed with a spoon, and absolutely indifferent to the calls of nature. He was discharged cured from the asylum in nine months, but readmitted six months later with a precisely similar attack. This in turn slowly passed away after a few months, to be followed by a state of extreme fatuity, the youth being liable to sudden outbursts of laughter or crying without any observable cause (see Fig. 67).

The following are illustrative cases of melancholia:

C. D., male. He could never learn arithmetic at school, as the master said his "brain was too weak." Used to behave very oddly at times. After leaving school was employed in a bootshop. At the age of sixteen he was frightened by a large black dog, and shortly afterwards became much depressed, gradually passing into a condition of melancholia. On admission to asylum he was found to have aural and visual hallucinations with delusions. He thought he was surrounded and threatened by black men; he said that he was afraid he was going to be killed in the China War, and that God told him to kill himself. For several days he was restless and anxious, afterwards becoming dull, listless, lethargic, and a confirmed masturbator; he would occasionally waken out of this stupor-

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FIG. 64.—A feeble-minded youth of the surly, loafing type. No regular employment. Fully convinced that he has "not had fair play." Has had attacks of acute melancholia.

FIG. 65.—A feeble-minded youth suffering from melancholia.

PLATE XXVIII.

ose condition to become aggressive and violent. Four years after admission he had so much improved that he was discharged to his friends, only to be readmitted six weeks later, as they found it impossible to manage him. He is now twenty-two years of age, and is still in the asylum, being idle and as a rule dull and depressed, and constantly muttering to himself; occasionally destructive and aggressive; signs of dementia are apparent.

T. K., male. Mental deficiency noticed from early childhood; incapable of learning at school; no work subsequently; never earned any money. Gave much trouble to his parents, being "very bad-tempered," and frequently wandering away from home. At sixteen years of age became much depressed, and attempted suicide by taking carbolic acid. On admission into asylum was wretched and tearful, saying that he wanted to die, and there was no reason why he should live. He gradually became brighter and even cheerful, and a month after admission was able to work out of doors; the improvement continued, and he was discharged in four months later he was readmitted, having been found by a policeman battering his head against some iron railings. On the way to the station he said that he would kill either himself or his father, the latter stating that he had been violent and had attempted to cut his (the father's) throat. He was profoundly depressed, thought he heard voices, and that people had conspired to kill him. At the present time he has been in the asylum four months. He is still depressed and solitary, but on the whole decidedly brighter, doing a little work, and appears to have lost his delusions.

Alternating and Recurrent Insanity.—In some cases the insanity takes the form of alternating attacks of mania and melancholia. In these patients, however, there are not usually intervening periods of complete cessation, as in the *folie circulaire* of French authors. The mania, which may be violent and acute, lasts for a time, and is then replaced by a state of melancholia of the ordinary variety, or *vice versâ*, and so the process continues. Perhaps such cases should rather be classed as recurrent insanity, and they usually terminate in dementia. It may be said here that in about one-third of the cases coming under my own observation there was no recovery from the first attack; the mania or melancholia became lessened in its intensity, but persisted as chronic insanity, gradually to terminate in dementia. In about two-thirds of the cases,

however, the first attack gradually and completely subsided after a period varying from a few weeks to two or three months; but the improvement was only temporary, and, as far as my experience goes, there is scarcely any class of patient in whom a recurrence is more likely to take place. This is seldom deferred for more than a year, and in the majority of the cases it comes on within a few months of the subsidence of the original attack. The second and subsequent attacks are usually of the same clinical type as the first, and they continue to occur at periods varying from three to twelve months for many years. In the intervals the patient is fairly quiet, and may do a certain amount of useful work, although his mental deficiency and instability prevent any regular employment. With the lapse of time, however, the insane attacks tend to recur more and more frequently, and the patient gradually passes into a state of chronic insanity, which is only terminated by the development of dementia.

Epileptic Insanity.—Many feeble-minded and imbecile epileptics are exceedingly irritable and liable to outbreaks of furious passion, and a considerable number develop insanity just the same as do ordinary epileptics. There are no special features, and the tendency is usually to early dementia.

Delusional Insanity.—It is of the utmost importance for those who have dealings with the feeble-minded to remember that many of them will make the most untruthful statements with a persistence and an amount of detail which may excite a ready credence in the unguarded. Whether such statements should be classed as delusions it is difficult to say. Sometimes I think the person does actually believe them to be true, that he is, in fact, deluded; but in other instances they are simply make-believe flights of fancy; whilst in a few they are the outcome of pure wickedness. But if these possibilities be not borne in mind, the consequences may be very serious. I have known feeble-minded children accuse their companions and teachers of all sorts of offences without the slightest foundation. I have known a feeble-minded girl accuse a medical examiner of rape, and only recently I was asked by the police to examine a feeble-minded girl of sixteen who swore most positively that her own father had been constantly in the habit of having sexual intercourse with her. It was subsequently proved that the charge was absolutely false. Another girl of this type caused grave scandal in the village in which she lived by circulating the

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FIG. 66.—Feeble-mindedness with marked mental instability. Liable to attacks of acute mania.

FIG. 67.—A feeble-minded boy. Age, 15½ years. Suffering from stupor (second attack).

PLATE XXIX.

statement that she was constantly in the habit of going for long, solitary walks with the vicar. This, again, was shown to be without a particle of truth. Occurrences like this are common, but a pure delusional insanity, in which the delusions remain fixed for a long period and do seem to be actually believed in, is not so common. The following is a fairly typical example:

H. M., a feeble-minded woman of thirty-three years of age, but small, ill-developed, and not looking more than twenty-three years. Her parents say that she never seemed bright intellectually, and since she left boarding-school at the age of nineteen she has been at home helping a little in the house and garden, but taking no responsibility. During the last five years she has become enamoured of several men she has chanced to meet, continually talking about them and trying to meet them, although they have apparently been quite ignorant of her feelings and have certainly given her no encouragement. Twelve months ago she became infatuated with a professional man (*Mr. C.*), whom she had accidentally met at a friend's house, and since then he has occupied all her thoughts. She writes letters to him, she is perpetually talking about him, and on several occasions her father has met her slipping out of the house at night to go and see him, as she said. Her behaviour caused such trouble to her parents that she was placed in the house of a medical man in the hope that change of scene would lead to change of thoughts. But she insisted that Mr. C. had followed her; she said that he was walking in the garden waiting to give her an engagement ring, and on several occasions she said that he had been in her room talking to her, although he was in reality a hundred miles away. When she was brought to see me six months later she still had the same delusion; she insisted that Mr. C. had come up in the same train with her, that she saw him get out at the station, and that at the present moment he was waiting for her in the street. As her father told me that on several nights she had got out of bed and had been found walking in the garden, that she was constantly slipping out of the house, and that they were finding it exceedingly difficult to keep her under observation, I advised that she should be certified and placed in a private asylum. This was done, but at the present time, six months later, her condition is unchanged, and she insists that Mr. C. is in the grounds or the next room, asking to see her, and she is very angry with the nurse for not allowing her to go

to him. So far as can be ascertained, she has never spoken to or even seen the object of her affections since their first meeting.

General Paralysis.—Aments may suffer from general paralysis of either the adolescent (juvenile) or ordinary variety; but the latter is relatively rare. The symptoms usually make their first appearance between the ages of fourteen and nineteen years, and consist of a well-marked mental change. The patient becomes either gloomy, depressed, and apathetic, or noisy, excited, and maniacal. Very often delusions of identity or of persecution are present, and there may be attempts at suicide. In some instances the mental disturbance takes the form of violent emotional storms of alternate excitement and depression. This condition persists with exacerbations and remissions for from one to two years, by which time the patient usually shows definite indications of mental and physical enfeeblement, the course thence to the end, a few years later, being similar to that in ordinary patients. In the cases which have come under my own notice there has always been a history or signs indicative of congenital syphilis, and I think that general paralysis is the usual (but not invariable) termination when this is present in the mentally defective.

The following cases illustrate the chief features of this complication of amentia:

M. D., female, the sixth of a family of ten. The fifth died of "water on the brain" in infancy, and the seventh and eighth were miscarriages. The remainder are said to be "all right." There is phthisis on the mother's side, but no insanity discoverable. The patient was decidedly backward at school; afterwards she stayed at home to help her mother, as she did not seem equal to taking a place. At the age of nineteen years she began to get mischievous and destructive, and finally became so troublesome that she had to be sent to an asylum. On admission in October, 1899, she was described as being of very poor intelligence, wet and dirty in habits, noisy day and night, talking incessantly and using disgusting language without any connexion of ideas. Her condition was such that systematic examination was impossible. She gradually became somewhat quieter, and when seen by me, nine months after admission, her condition was as follows: A lethargic, almost stuporose girl who spent the whole day sitting in a chair, indifferent to anything happening round her. She understood what was said to her, but was unable to carry on conversation or to answer simple ques-

tions properly. Speech slurred and tremulous. She attempted to write at my request, but her hand was so shaky that it was impossible to do so. Knee-jerks greatly exaggerated; extremities blue and cold. No paresis; no seizures. Well-marked signs of rickets and congenital syphilis. I diagnosed syphilitic amentia, with beginning general paralysis, but was unable to see the patient again, and had entirely forgotten about her until going through my notes. The medical superintendent was good enough to supply me with the subsequent history, from which it appeared that unmistakable signs of general paralysis were noted towards the end of 1901; that phthisis was observed in February, 1902; and that she died on March 29 of the same year. Her age at death was twenty-three years, and the cause, as ascertained post-mortem, was general paralysis and phthisis.

T. C., male. Father alcoholic and insane; his mother and all his brothers and sisters alcoholic. The patient is the second of a family of eight; the first-born died aged two and a half months, and the mother was told by the doctor that, had it lived, "it would have been blind and an idiot." The fourth child, whom I have seen, has marks of congenital syphilis. The patient was backward in walking and talking; his mother says he could never "get his words out properly." He went to school, but could never learn, and the schoolmaster said he was "a regular fool." He subsequently had several situations, but no one would keep him very long. At fifteen years of age he began to get very bad-tempered and strange in his manner; he had attacks of screaming, which lasted for hours; and ultimately, at seventeen years, was sent to an asylum with acute mania. This gradually subsided, revealing a condition of mild imbecility with beginning dementia. When asked his name and age, he would plaintively reply: "I ain't got no name" and "I ain't got no age." The dementia progressed and became extreme, and he died, aged nineteen, of exhaustion following a bout of seizures.

The post-mortem examination revealed a simply convoluted brain, weighing 1,167 grammes, and having the characteristic appearances of general paralysis. The microscope showed a condition of imperfect cellular development, plus subacute degeneration, similar to that occurring in general paralysis.

L. B., female. Was admitted into the asylum at the age of fifteen, the certificate stating: "She sits apparently dazed, taking

no interest in anything that is going on Threatened to kill herself. Tears her clothing, and at times cries and stamps her feet." The history is incomplete, but it was elicited that the patient had been dull and of defective eyesight since birth; that her mother died, aged forty-two, of general paralysis; and that her father was alive, and said to be in good health. Though intellectually dull, she was said to have been cheerful until the last six months, since when she had become stubborn and morose, finally helpless, dirty in her habits, and quite unable to look after herself.

On admission the pupils were dilated, the reaction to light sluggish, and her memory for time and events much impaired. She was gloomy and apathetic, and had delusions, such as that ferocious dogs were coming after her. There was left external strabismus, but no other observable paresis and no convulsions. The knee-jerks were exaggerated. Marks of congenital syphilis were present. Cranial circumference, 21¾ inches. She was considered to be a case of syphilitic amentia with superadded dementia. The dementia steadily increased, and the patient died at the age of eighteen years of broncho-pneumonia.

On making a post-mortem examination, I found the brain to be of fair size (1,176 grammes), but somewhat simply convoluted. The optic nerves were exceedingly small. The brain and membranes had the characteristic naked-eye appearances of general paralysis. A microscopical examination of various regions of the cortex cerebri revealed a marked numerical deficiency of the cells; many of them were also of incomplete development and irregular arrangement. These indications of imperfect development were most pronounced in the small and medium-sized pyramidal cells of the frontal lobes. In addition, there was a considerable amount of chronic and sub-acute degeneration, with proliferation of neuroglia identical with that occurring in general paralysis.

Daisy K——, female, twenty-two years. Always seemed dull mentally, left school aged fifteen years, and has been at home since, as she never seemed sharp enough to earn her living. For the last twelve months has been subject to what mother calls "hysterical fits," during which "she screams, throws herself about, and does not seem able to control herself at all." For the last nine months her memory has been failing, and she has become less capable of doing little jobs about the house; she has also been getting much thinner, and there has been a marked alteration in her manner of

walking—"She seems to be losing power in her legs." During the last six months her mother has noticed trembling of hands and mouth, she has become slovenly in her feeding, and on several occasions has wetted herself. She got rapidly worse, and when brought to me there was very considerable wasting; the nose, cheeks, and extremities were livid and cold; there was much tremor of hands, tongue, and mouth; her handwriting was so shaky as to be illegible; the pupils were unequal and did not react to light; interstitial keratitis was present and well-marked syphilitic teeth; the knee-jerks could not be obtained; the hand-grasps were very feeble, and the walk staccato in character. Mentally there was considerable loss of memory and intellectual impairment. To many questions she made no response, and to others only after a long silence. She knew where she was, but had no knowledge of the day or year. She was at times silent and depressed, but at others noisy and excited; she refused food, resisted being washed and dressed, and was constantly wet and dirty. She was removed to the asylum, where she died a few months later of general paralysis. With regard to the family history, the father had contracted syphilis several years before marriage, for which he had been treated for two years. He is alive at the present time, aged fifty-five years, being addicted to alcohol and having twice failed in business. Both the mother's parents died of apoplectic strokes, the mother herself being alive, aged fifty-four years.

The following case of *General Paralysis in an Adult Ament* is recorded by Dr. Cappelletti:*

The patient, a female imbecile aged fifty-four years, was turned out of her home by her brother, and came to great want; she was taken into the asylum in a maniacal condition. She had a small, asymmetrical skull, tremor of tongue, face, and extremities, hesitating and tremulous speech, wide, unequal pupils which only reacted feebly to light and accommodation. No signs of syphilis on the body. Mental condition exalted, with grandiose ideas. Death occurred after two years in consequence of apoplectiform attacks. Post-mortem examination showed thickening of the dura and pia, with adhesions and cortical erosions. Small frontal lobes, asymmetrical hemispheres, and a narrow grey substance. The basal arteries were atheromatous.

The author refers to two other similar cases which have been

* *Neurolog. Centralbl.*, 1898, p. 558.

described, and in a subsequent note states that the asylum register at Ferrara shows the existence of a fourth.

Dementia.—Many aments become demented in their later years, and *secondary dementia* is the natural termination of most of these cases of insanity, its advent depending chiefly upon the type and the frequency with which recurrences occur. Occasionally a condition of *primary dementia* occurs in adolescents, which is clinically very similar to dementia præcox. The patient becomes apathetic, idle, and neglectful, and eventually quite incapable of any occupation. With this there may be present echolalia and certain stereotyped mannerisms; but neither delusions, exaltation, or depression. Plaskuda* has described a series of fifteen cases of dementia præcox which occurred in aments resident in the Idiot Asylum at Lübben. Generally speaking, however, primary dementia in young aments is of such rare occurrence that its presence, without antecedent insanity or epilepsy, is nearly always indicative of juvenile general paralysis. In the insanity accompanying epilepsy, or even in severe epilepsy without insanity in these patients, dementia is usually ushered in fairly early. In the sudden and violent, but short-lived, storms of the emotional type, on the other hand, it is late, and I have known such patients show no sign of dementia after many years. The ordinary attacks of insanity seem to lie midway between these two extremes, and in most of my cases definite symptoms of dementia were observable within about eight years of the first attack.

It is thus seen that in the life-cycle of the ament we may have an epitome of all the main varieties of mental disease. Beginning with a defective brain, he may early show signs of mental instability and imperfect function; this passes on into various types of insanity, and finally culminates in complete degeneration of all the little faculty he once possessed—dementia.

* W. Plaskuda, *Allgem. Zeits. f. Psychiat.*, Band. lxxvi., Heft.

CHAPTER XVII

MENTAL TESTS AND CASE-TAKING

THE diagnosis of the severer grades of mental deficiency is usually made without much difficulty, but that of the mildest degree is by no means so easy, and often can only be achieved after a careful study of the case in all its bearings combined with a very considerable experience on the part of the observer. Such diagnosis is now not infrequently called for, both in the case of children and adults. For instance, the advice of the physician may be sought on behalf of a child who seems dull, unable to cope with his lessons, or whose conduct is becoming perverse and antisocial; in the case of adults he may be required to examine and give evidence on account of incendiarism, stealing, or other more serious offence, or he may be called upon to give an opinion as to the capacity of an individual for managing his affairs. In any of these instances the question of the presence or absence of mental defect will arise, and it is one which may tax the ability and experience of the physician to the full. But there can be no doubt that, under the Mental Deficiency Act of 1913, the number of such cases will be greatly increased, and that consequently the diagnosis of mental defect will come to occupy a very important place in medical practice. Such diagnosis necessitates methods of examination which not only differ very considerably from those in ordinary use, but to which little attention has hitherto been given by the practitioner, and since the legal position of the mentally defective now renders it extremely advisable that such examination should be systematic and carefully recorded, I propose in this chapter to give an account of the methods of examination and case-taking. We shall then be better able to deal with the matter of diagnosis in the following chapter.

The examination of a person regarding whom there is a question

of mental defect resolves itself into three lines of inquiry: *firstly*, with regard to his previous history; *secondly*, his family history; and *thirdly*, his present state. The first and second of these do not differ from similar inquiries which the physician is called upon to make in regard to ordinary patients, although it is necessary to have a knowledge of those factors which are of special significance and concerning which information must be obtained. The third line of inquiry embraces methods of examination which are very different from those in ordinary use, and these we shall now consider. I shall conclude with a form of case-taking which I have found of practical utility.

MENTAL TESTS.

During recent years very great advances have been made in experimental psychology, and many volumes have now been written dealing with the subject of mental tests. Although many of these tests are still in the experimental stage, and will themselves require to be tested before their value can be accurately determined, there can be no doubt that the science is one which has a great future before it in the elucidation of the problem of mental development and the practical work of education. This importance, indeed, has long been recognized in America, and for seventeen years there has been in existence a Psychological Clinic at the University of Pennsylvania for the express purpose of scientifically studying and advising as to the education of abnormal children. An exceedingly interesting account of the organization and operation of this clinic, together with much valuable information regarding mentally and morally abnormal children, has been recently given by Dr. Arthur Holmes,* the Assistant-Director. In England, however, the value of such methods has not yet been officially appreciated, and although the scientific study of the school-child has long received attention at the hands of a number of highly qualified experts, the psychological clinic is still a thing of the future.

But it must be confessed that the applicability of the methods of the psychological laboratory to the defective mind is limited. Most of them require an intelligence and co-operation, besides an amount of time and apparatus, which not only render them unsuited for the purpose of diagnosing the condition we are dealing with, but which makes their use impossible in the consulting-room. And

* A. Holmes, "The Conservation of the Child," Philadelphia, 1912.

in the case of the adult, the test of conduct, as revealed by his life-history, is often a criterion of far greater value than is his response to laboratory tests. Nevertheless, mental tests, if properly understood and applied, have a distinct value which it is impossible to over-rate. They supply us with definite information regarding defects and abnormalities of working which, when rightly interpreted, are of the utmost assistance to diagnosis, and they will be the means of carrying us on from that imperfect knowledge of the defective mind with which we have hitherto been compelled to be satisfied to a more precise and scientific knowledge of the subject.

These tests have been designed to further several ends. For one, the ascertainment of information regarding the construction and working of the normal mind; for another, the erection of standards of comparison; and for another, the detection of abnormalities and defects. The scope of this book is that of the defective mind only, and my present purpose is to discuss the diagnosis of such defect; consequently I shall confine my remarks to such tests as have definite diagnostic value. For fuller information the works of Whipple, Holmes, Myers, Titchener, and others may be consulted, to which I here express my great indebtedness.*

Before describing these tests, a few preliminary remarks regarding their use may not come amiss. In the first place it is to be remarked that no mental test is a graduated standard, like a yard measure, which will automatically register the quantity and quality of any particular psychological function. Acuteness of observation, clinical experience, and some knowledge of psychology are all required on the part of the observer, and without these failure will be inevitable. As a matter of fact, the knowledge gained is far more dependent upon the power of interpretation possessed by the examiner than upon the nature of the test applied, and an experienced physician will form a better estimate of a patient's mental capacity from a short conversation than will the inexperienced and unobservant from the whole series of laboratory experiments. I entirely agree with Dr. Holmes when he says:

* G. M. Whipple, "Manual of Mental and Physical Tests," Baltimore, U.S.A., 1910. This is an excellent compilation, giving all the most recent tests, full instructions as to their use, and an account, with copious references, of the results obtained by many observers.

C. S. Myers, "Textbook of Experimental Psychology," Cambridge, 1911; also "Introduction to Experimental Psychology," 1911.

E. B. Titchener, "Experimental Psychology," New York, 1901.

"How well he accomplishes his assigned tasks, or plays his games, or is able to acquire the ordinary rudiments of an education under the same conditions that obtain with normal children, are of far more importance for predicting his mental ability to hold his own in society than many a fine-drawn technical test worked out in a laboratory."*

Underneath the bell of my front door is a brass plate inscribed, "Please do not ring unless an answer is required." It is intended to save my servants unnecessary labour, not to test the intelligence of callers; but I often think it affords a mine of information regarding them. One person will come with a note, put his hand on the bell, see the plate, take his hand away, drop the note in the letter-box, and go away. Another will desist from pulling the bell, but hammer at the knocker, and give the maid a note with the remark that, "There's no answer." Another will read the notice, put the letter in the box, give a vigorous pull at the bell, and then retire. Yet another, with a message for which he has been told to await an answer, will stand helplessly bewildered because the plate says, "Do not ring." I have little doubt that by this simple means a good clinician would arrive at a tolerably accurate estimate of the mental status of most of these people.

In conducting these tests it is essential to gain the confidence of the subject and to put him at his ease. This necessitates time and patience; but the physician who is hurried and perfunctory will inevitably confuse his patient and come to erroneous conclusions. I regard this maxim as fundamental. Whatever test is used, the particular information it is desired to elicit must be quite clear in the mind of the observer, and when the result is obtained, it must be noted at once, together with such comments as are necessary to make the reaction quite clear on a subsequent reading. Finally, I need hardly say that the tests to be described are a catalogue of what *may* be used in particular cases rather than a list to be gone through in every instance.

Vision.—If the patient knows the letters, the ordinary Snellen's types may be used. If he does not, the E-test described by Dr. C. S. Myers,† or a series of pictures of different animals of varying sizes pasted on a card may be made to answer the same purpose. If it is desired to test colour vision, he may be asked to match

* A. Holmes, *op. cit.*, p. 185.
† C. S. Myers, *op. cit.*

coloured wools, or use may be made of small wooden cubes, each side of which is painted a different colour. Boxes of these are obtainable from most toy-shops. Any serious visual defect will necessitate a retinoscopy and the prescription of suitable glasses.

Hearing.—The manner in which the patient responds to the voice of the examiner, which may be varied from the ordinary tone to a whisper, is usually a sufficient test. It may be advisable not to allow the lips to be seen. In cases where there is any doubt a watch may be held at varying distances from each ear in turn, or he may be tested by a bell, whistle, or tuning-fork.

Taste.—When it is necessary to investigate this sense, it may be tested by touching the tongue with powdered salt, sugar, starch, and quinine, and noting the subject's power of appreciation.

Smell is tested by allowing the child to sniff bottles containing such essences as peppermint, cloves, almonds, and vanilla. He is not required to name, but only to distinguish between them.

Cutaneous Sensibility may be tested by the response to the prick of a needle; by the application of test-tubes filled with iced and hot water; and by getting the blindfolded child to say which is rough and smooth of a piece of velvet, wood, and sandpaper, etc. I often make use of a little bag in which is placed a miscellaneous collection of small objects such as a penny, marble, button-hook, match-box, and reel of cotton. The patient is required to say what they are by placing his hand in the bag without seeing them, and I find this to be interesting as well as instructive.

Attention.—By the measure of attention is meant the quantitative capacity of the person for mental effort in one direction. As we have seen in the preceding pages, this varies very greatly in aments, and is undoubtedly a very important factor in their ability or otherwise for learning and useful employment. But its degree is dependent upon interest; consequently, in order to gauge its amount it is desirable to apply such tests as are not only devoid of interest, but which may even be distasteful. If these fail, recourse may then be had to others of a more interesting nature. The following tests are those I have found most generally suitable for the milder cases:

1. *Bourdon's Cancellation Test.*—The patient is given a card containing several lines of capital letters printed at random from a pile of mixed type ("pied" material), and is required to cross out all those of a certain character. Perhaps the simplest letter to take

is O. It is rendered more difficult by asking him to cross out C or B, which are liable to be mistaken for G or R, and the difficulty is further increased if several letters are required to be cancelled at the same time. The number of mistakes and the time taken is to be noted. If the "pied" material is not to hand, an ordinary piece of printed matter will serve the purpose.

2. *Card-Sorting.*—The patient is given a well-shuffled pack of "Snap" cards, and is required to sort them out into heaps according to the pictures. This test is decidedly more interesting than the former one; it may be made less so, and more difficult, if ordinary playing cards be substituted for the "Snap" cards and the subject required to sort them into suits.

Association.—A very fair idea of the patient's power of association will be obtained by asking him to tell all he can about such familiar objects as a cat, cow, chair, or knife. Where more definite information is desired, the following tests are suitable for the milder grades:

1. *Part-Wholes Test.*—The patient is given a card on which are printed ten words such as—Door, letter, leaf, page, pillow, button, nose, cover, engine, glass. The examiner instructs the patient as follows: "I shall give you a paper on which are printed ten words. I want you, as rapidly as you can, to give for each word the name of the whole thing of which the word is a part. For instance, if the word "fur" were given, you would name a thing that "fur" is a part of, like "cat"; for "hand" you might say "arm" or "watch." The examiner writes down the words as the patient gives them, and if the time be taken, useful comparisons may be instituted between different subjects.

2. *Genus-Species Test.*—The principle is the same as in the preceding test, but the words given are those of a general class, and the patient is required to name particular instances of that class. For example, correct answers for "animal" would be any kind of animal; for "man" any nationality; for "geography," such words as a—River, cape, bay, etc.; for "money," any particular coins.

3. *Opposites Test.*—The patient is given a card containing a list of twenty words, and is required to give for each one a word having the opposite meaning. The lists vary in difficulty, those in List A being such as—Bad, inside, slow, short, etc.; those in List C being such as—Proud, obscure, superior, sane, obnoxious, etc. The number of mistakes and the time taken are noted.

Memory.—Any marked defect of recent memory will be detected if the patient be asked to give an account of what he has been doing that day, what he had for breakfast, what he saw on his way, and so on. His remote memory may be similarly tested by getting him to describe some former happening, such as the holiday last year, a former school, etc. It is necessary to remember that a child may make up for lack of memory by invention, and his accounts should always be checked by inquiries of an independent source. More special tests for memory are the following: Arrange on a board twelve common articles (*e.g.*, knife, pen, cork, penny, match, etc.), let the subject look at them for sixty seconds, and then remove and ask him to enumerate them. Instead of common objects, the subject may be shown a series of cards on which are printed varying numbers of nonsense syllables or figures. Each card is exposed for a definite time, and the exposures continued until he can repeat them without error. The number of readings necessary for this gives the span of immediate visual memory. The span of auditory memory may be similarly tested if the contents of the cards are read to the patient and not seen by him. Retentiveness, or perseveration, may be gauged if the patient be again asked to repeat the objects, syllables, or numbers on the following day or at the end of the interview.

Tests of Description and Report.—Closely allied to the foregoing tests of association and memory are those known as tests of description and report, which may here be mentioned. The object of these is to determine the subject's general capacity to attend, observe, and recall what he has seen. There is no doubt that they are of considerable value, and that an acute observer is enabled by their means to form a very good estimate of the general mental capacity of a patient. As Dr. Whipple very truly says, the activity here investigated is not only a more complex psychical process than that examined by the ordinary tests of attention and perception; but it " is more akin to that demanded in everyday life, and it is for this reason that these tests have been felt to possess a peculiar value, particularly in the study of individual differences in mental constitution and mental efficiency." The tests are as follows:

1. *Description of an Object.*—The patient is given some object, such as a cancelled postage stamp, a cigarette, a box of matches, etc., and instructed to write a description of it, so that one who had never seen it before would know all about it. Ten minutes

or more are allowed for the task, according to how the patient is getting on.

2. *Fidelity of Report* (*Aussage Test*).—One method of this consists in showing the patient, for a period of half to one minute, a series of six small objects like those used in testing memory; but instead of him being merely required to enumerate them, he is closely interrogated regarding the minute features of each one—*e.g.*, the value of the coin? is it a head or tail? whose head? what date? is it bright or dull? how is it fastened to the board? etc. Instead of a collection of objects a series of pictures may be shown, and the patient subsequently closely questioned regarding each detail. This is the method of Stern,* who has experimented with it very extensively, and is its chief exponent.

These tests are, of course, only suited to the mildest grades of mental defect, and all such persons show a marked inferiority as compared with the average normal.

Suggestibility—Facility.—As we have seen in preceding pages, the conduct of many aments is antisocial or immoral by reason of their ready amenability to evil influences, and in some cases it may be desirable to give an actual demonstration of this facility. There are many tests designed to this end, false suggestions being made by size-weight illusions, by lines of varying length, and by bodies of different temperature. Since, however, in everyday life the yielding is more often the result of personal influence or in response to a command, the most suitable tests are those which utilize this factor, and probably the "line test" as used by Binet is the best for the purpose. It is as follows:—*Materials* required: a sheet of cardboard, on which are drawn twenty-four parallel straight lines, ranging in length from 12 to 104 millimetres by increments of 4 millimetres. The lines of all begin at the same distance from the left-hand margin, are 7 millimetres apart, and are numbered in order of their length from 1 to 24. This is called the "comparison card." Three rectangular pieces of cardboard, about 12 by 20 centimetres, on each of which is drawn a single straight line. These three stimulus lines correspond to numbers 6, 12, and 18 of the twenty-four comparison lines, and are accordingly 32, 56, and 80 millimetres long respectively. *Method:* Show the subject the card of comparison lines, and explain their numbering. Then show him the first stimulus line (32 millimetres), and

* L. W. Stern, "Zur Psychologie der Aussage," Berlin, 1902.

tell him to look at it carefully. After four seconds the stimulus card is removed and the comparison card again presented, and he is asked to denote the number of the line that is the same length as that he has just been looking at. Upon his reply the observer says, "Are you quite sure? Isn't it that?" indicating the next in length. If the subject persists, the question is again repeated; if he still persists he is recorded as "resisting," and a similar trial is made with the other two stimulus lines. If he acquiesces in the suggestion, the observer points to another line still longer than the stimulus line, and proceeds from line to line until the suggestion has been resisted twice.

Emotional Reaction.—The emotional disposition of the patient will usually be best revealed by inquiries as to his general behaviour. If necessary, it may be tested by noting his response to pictures designed to provoke sorrow, sympathy, anger, fear, mirth, etc. Recently it has been stated that the mental content may be revealed in an extraordinary way by supplying the subject with a printed list of a hundred carefully selected words and telling him to read each of them, and at once, without any consideration or delay, write down the word which comes into his mind.* In the case of the mentally defective, however, the response is usually so slow that this method is not suitable. In normal persons the *train of thought* is frequently tested by the device of requiring the subject to write as rapidly as possible every word which comes into his head until one hundred have been written. The list is then subjected to careful analysis, and often supplies valuable information regarding the rate and quality of thought, the mode of association, etc. This, however, is rarely applicable to aments.

Judgment and Reasoning. — Reasoning is a highly complex mental process necessitating attention, observation, association, and memory; but perhaps, above all, the ability to appreciate and compare essentials. The best test of a person's reason is afforded by his conduct and behaviour under varying circumstances of real life, and in dealing with adults in particular, the physician should never neglect to make a thorough investigation regarding this. In cases where such information is not forthcoming, and in children, the following tests may be made use of. They are arranged in order of

* See A. Holmes, *op. cit.*; also an interesting article by C. Burt on "Experimental Tests and their Relation to General Intelligence," in *Journal of Experimental Pedagogy*, November, 1911.

difficulty, and failure in the first four indicates a very low grade of defect, whilst the last two or three can usually be accomplished by normal children of ten years of age, but not by the feeble-minded.

1. Tell the subject to go and sit on a chair which is turned upside down or occupied by some bulky article.

2. Tell him to get an article from a shelf which is beyond his reach, but which might be reached if he stood on a chair.

3. Tell him to go outside the room when the door is locked and the key hanging on the door in a conspicuous position.

4. Turn his coat sleeves inside out and tell him to put it on.

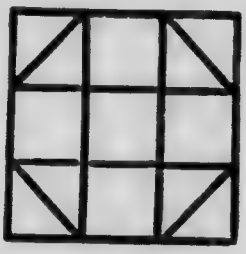
5. Give him a knotted cord to untie.

6. Tell him to get a particular key off a split ring.

7. Identify objects from drawing showing only portions.

8. Show an unfamiliar object and ask him to describe its use.

9. Trace the following figure without taking pencil off or going over a line twice.



Under this heading we may mention what is known as the "completion method" of Professor Ebbinghaus,* which consists in the subject being required to restore the words, or at all events the meaning, to a passage from which certain syllables, words, or phrases have been deleted. It is obviously a test the simplicity or difficulty of which may be varied within a very wide range, according to the nature of the passage used and the number of words deleted, and Ebbinghaus and others attach very great value to it; but it seems on the whole decidedly more applicable to the non-defective than to the defective mind.

General Intelligence and Capacity.—The tests hitherto considered have been designed for the purpose of gauging the activity, and noting abnormalities, of particular psychological processes. It is

* H. Ebbinghaus, "Ueber eine neue Methode zur Prüfung geistiger Fähigkeiten," etc., *Zeitsch. f. Psychologie und Physiologie der Sinnesorgane*, 1897.

not, of course, thereby to be inferred that the processes of mind act independently of one another, and that we can really separate them in this way. As a matter of fact, most of the foregoing tests will not fail to supply information regarding many other functions than the one to which the test is directed. It is, nevertheless, convenient to speak of them, and to use them, as tests of the "elements" of mind, and the sum of the results so obtained does undoubtedly enable a tolerably accurate estimate to be formed of the capacity and working of the mind as a whole. But to go through the whole of these tests is tedious, and requires more time than is at the disposal of the clinician; accordingly, in actual practice, it is often a great advantage if we can arrive at an estimate of the net resultant of the mental capacity of the individual by a simpler method. In many instances this is possible, and I think the two following methods (I hardly like to dignify them by the name "tests"), which I have now been in the habit of using for many years, do afford sufficient information for purposes of diagnosis in the majority of cases.

1. *Range of Information.*—Every mentally normal child has within him an innate capacity which causes him to notice, feel, speculate upon, discriminate between, and so acquire information regarding the objects of the world in which he lives. He does this in his play and in the absence of any formal instruction, and unless his environment has been very unusually adverse, he soon becomes acquainted with the names, uses, and many other details regarding the things by which he is surrounded. With the mentally deficient child it is different. His intrinsic lack of initiative, observation, attention, memory, ideation, and reason result in a defective range of information which contrasts in a most marked manner with that of the normal child, and a little judicious questioning cannot fail to bring out the difference in the clearest possible way. The method to which I attach great practical value, therefore, is to engage the child in conversation regarding the incidents and surroundings of his daily life. His knowledge of, and manner of response to, such simple questions as "What is a cat or a horse?" "What is it for?" "What does it do?" and the like, will often afford all the information as to his state of mind which is needed by a physician who knows how to interpret the answers so given. Two things are needed—a general knowledge of the intellectual range of the average normal child, which every practitioner should possess; and a know-

ledge of the child's environment. I mention this latter because I have known a town-bred child who had migrated to a country school stigmatised by the teacher as mentally deficient because he did not know what a blackbird was like! He had never seen nor heard of one.

2. *Dissected Picture Test.*—This test is a modification of, and was suggested to me by, the now popular "jig-saw" puzzles. I have used it for several years, and believe it to be one of the most simple and practical means we have for estimating the general mental capacity of a patient as seen in the consulting-room. It is not suggested as a standard of measurement for the comparison of children of different ages. No doubt it might be so used were a sufficiently large series of observations made with the same pictures; but I regard its main use as indicating the innate capacity and presence of abnormalities in the individual. It is as follows: A series of pictures mounted on stout card are cut up into squares of equal size, so that each square will fit into any place in the picture. The pieces of one picture are well shuffled, and the child required to reconstruct. The cutting up into interchangeable squares has this advantage over the ordinary dissected puzzles, that no guidance is obtained by the particular shape of the piece, but only by the picture itself. I have a series of six such dissected pictures. The simplest of all really consists of half a dozen separate figures—*i.e.*, a policeman, soldier, sailor, nurse, wooden doll, and clown,* and each figure is divided into three parts—namely, head and neck, body, and legs. The child is furnished with the shuffled pieces of two, three, or any number of these figures, and required to put them together in their proper place. All feeble-minded children of school age can do this; but the majority of imbeciles fail, and either make no response or put the pieces together any way, even sideways. The most difficult picture is one which represents two persons ski-ing amongst a mass of snow, ice-peaks, and sky. The complete picture consists of fifty-four 2-inch squares, and I have found its reconstruction tax the attention, perseverance, and judgment of many intelligent persons. It is, however, divisible into three separate pictures, and then the task is simpler. Intermediate pictures are a rural scene, with river, bridge, sheep crossing, cottage amongst trees, and church in the distance. This consists of twelve

* The "Golly Misfitz," published by G. W. Faulkner and Co., and sold by most toy-shops, answers the purpose admirably.

2-inch squares; a small copy of Raphael's Sistine Madonna; a copy of Dante and Beatrice,* etc. In using these tests for children I usually begin with the simplest; it is brightly coloured, attractive, and not only arouses interest, but serves to restore confidence and put the child at his ease. If this is done without difficulty, I then pass on to the next in the series. There is no time-limit, and the value of the test lies not merely in whether the child does it correctly, but in his manner of going to work and in the answers he gives to a few questions regarding it at the end. This test, of course, necessitates observation, ability to interpret, and some knowledge of psychology, on the part of the examiner; but given these, I know of no single test which will give more information regarding the subject's visual, auditory, and tactile sensation; his association, memory, and attention; his reasoning and judgment, initiative, and pertinacity, as well as the quantity and quality of his muscular movements.

In this place we may also refer to the tests of reading, writing, and arithmetic. In many cases the physician will be furnished with information regarding the patient's accomplishments in these respects; but, apart from the desirability of checking these statements, these three tests are capable of yielding such valuable information that they may often be used with great advantage. All that is needed is to require the patient to read a few simple paragraphs, to write a few sentences from dictation, and then to submit him to a few questions regarding the meaning of what he has read or written. But such means will provide the observer with data regarding vision and hearing, obedience to command, attention, memory, capacity for ideation, emotion, muscular inertia, over-action or inco-ordination, as well as the degree of his scholastic retardation, which is of great importance to diagnosis. With regard to arithmetic, I usually test the patient's knowledge of simple addition and subtraction, mentally and by means of coins.

Movement.—The quantity and quality of movement is not only an important indication of a person's mental action, but it has to

* I selected these pictures because they seemed to me particularly suited to the purpose in view; but there is nothing special about them, and many others would do equally well. All that is necessary is that they should form a series, that they should represent objects which are familiar, and that each should be cut up into interchangeable squares of a suitable size.

be taken into consideration in advising as to treatment and occupation; hence it is very desirable to make an examination on this point. The quantity of movement—that is, whether in excess or defect—is readily revealed by observation of the manner in which almost any of the preceding tasks are performed. For instance, in one person the response will be slow, laboured, and hesitating; whilst in another action is quick, excessive, and often accompanied by pronounced tricks and habits. Inco-ordination of the hands is readily detected by such simple tests as requiring the subject to write a sentence from dictation, to pick up a pin or coin from a polished table, or to thread a needle; inco-ordination of the legs by requiring him to walk along a line, to stand on one leg, and to turn round quickly; whilst of higher levels the nature of speech may afford useful indications. Dr. Warner's tests have already been referred to on p. 128, and are very delicate and valuable indications as to the condition of the patient's motor centres. The manner in which he executes these imitation movements affords a very good test of his capacity for forming motor ideas; whilst his obedience to two or three simple commands given simultaneously, such as, "Take this book and place it on that chair, then open the door and walk to the window," will afford an indication of his retentiveness of motor ideas as well as of his general intelligence.

Graduated Serial Tests.

During the past few years certain series of tests have been devised for the purpose of gauging the mental capacity of children according to age, and of detecting defects and abnormalities in relation to normal stages of development. Of these, the best-known and most useful are those of MM. Binet and Simon of Paris, and De Sanctis of Rome. There is no doubt that such serial tests have a very great value, and that they represent a distinct advance in our methods of grading normal and defective persons. Those of MM. Binet and Simon, in particular, are based upon a large number of observations conducted with the greatest care and thoroughness, and the tests have been most skilfully thought out and arranged. It is necessary to remember, however, that they relate to French children, and it by no means follows that mental evolution proceeds upon precisely similar lines in the Anglo-Saxon and Latin races. Indeed, experience with these tests

would seem to show that there are several points of difference between children of the two races, and the modifications proposed by Dr. Goddard appear to be an improvement where the tests are applied to English and American children. These tests must be used with discrimination, and they by no means do away with the need for skill, patience, and deduction on the part of the observer; indeed, Monsieur Binet definitely states that for the results to have scientific value they must be applied by persons possessing a thorough practical knowledge of experimental psychology. In skilled hands, however, they have proved of very great use, and Dr. Goddard, who has applied them to 400 feeble-minded and 2,000 normal children, says: "Experience with these tests has continually reassured us, not only as to their value, but as to their amazing accuracy."

MM. Binet and Simon* have modified and altered their tests very considerably since they were first introduced, and Goddard† has also made several additions and improvements. The following is the latest series, as modified by Goddard:

Binet-Simon Tests.

Three Years.

(1) Points out nose, eyes, and mouth. (2) Repeats two numbers. (3) Enumerates the objects in a picture. (4) Knows name. (5) Repeats a sentence of six syllables—*e.g.*, "It is cold and snowing." (An average child of three can repeat six, but not ten, syllables.)

Four Years.

(1) Tells whether a little boy or a little girl. (2) Names familiar objects—*e.g.*, key, knife, penny. (3) Repeats three numbers. (4) Points out the longer of two lines.

* The most recent work of the original authors, MM. Binet and Simon, is contained in *Bulletin de la Société Libre pour l'Étude Psychologique de l'Enfant*, April, 1911.

† A full description of Dr. Goddard's procedure is given in "The Grading of Backward Children," issued from the New Jersey Training School, 1909, and his latest revision (as described above) is given in *The Training School*, June, 1911. For some important criticisms, results, and suggestions see also Decroly and Degand in *Archives de Psychologie*, 1910

Five Years.

(1) Tells which is the heavier of two weights. (2) Copies a square. (3) Repeats a sentence of ten syllables—*e.g.*, "His name is John. He is a very good boy." (4) Counts four pennies. (5) Reconstructs an oblong card which has been cut diagonally into two pieces.

Six Years.

(1) Knows whether it is morning or afternoon. (2) Says what common objects are used for—*e.g.*, fork, chair, table, horse, mother. (3) Obeys triple commands—*e.g.*, puts key on chair, brings box, shuts door. (4) Shows right hand and left ear. (5) Says which is pretty and which ugly of a series of drawings of faces.

Seven Years.

(1) Counts thirteen pennies. (2) Describes pictures. (The same pictures as for three years are used, but the child is now required to describe them, not merely enumerate objects.) (3) Notices that certain parts are missing from drawings of incomplete figures. (4) Can copy diamond. (5) Names four colours—*e.g.*, red, blue, green, yellow.

Eight Years.

(1) Compares two things from memory, such as fly and butterfly; wood and glass; paper and cloth. (2) Counts backwards from 20 to 1. (3) Repeats the days of the week. (4) Counts stamps, 1, 1, 1, 2, 2, 2. (5) Repeats five figures, 4, 7, 3, 9, 5.

Nine Years.

(1) Gives change out of shilling. (This is done with the toy-shop game, using real money.) (2) Describes common objects by definition superior to use. (3) Knows date. (4) Repeats the months in order. (5) Arranges five weights in order of heaviness (each differs by 3 grammes).

Ten Years.

(1) Knows money : £1, 10s., 2s. 6d., 2s., 1s., 6d., 3d., 1d., ½d. (2) Copies two simple designs from memory after having seen them for ten seconds (a prism and a Greek moulding). (3) Repeats six figures: 8, 5, 4, 7, 2, 6;—2, 7, 4, 6, 8, 1;—9, 4, 1, 7, 3, 8. (4) Comprehends easy questions. (5) Uses three given words in two sentences.

Eleven Years.

(1) Sees absurdity in statements—*e.g.*, "An unfortunate bicycle-rider broke his head and died instantly; he was picked up and carried to a hospital, and they do not think he will recover." "I have three brothers, Paul, Ernest, and myself." "Someone said, 'If I kill myself in despair some day, I shan't choose Friday to do it, because Friday brings you bad luck!'" "We met a man who was finely dressed; he was walking along the street with his hands in his pockets, and twirling his cane." (2) Uses three given words in a single sentence. (3) Gives sixty words in three minutes. (4) Gives three rhymes—*e.g.*, to day, spring, mill, etc. (5) Re-arranges a simple sentence the words of which have been put out of order.

Twelve Years.

(1) Repeats seven figures. 2, 9, 6, 4, 3, 7, 5;—9, 2, 8, 5, 1, 6, 4;—1, 6, 9, 7, 2, 3, 8. (2) Defines charity, justice, goodness. (3) Repeats a sentence of twenty-six syllables—*e.g.*, "I saw in the street a pretty little dog. It had curly brown hair, short legs, and a long tail." (4) Resists suggestion made by lines of different lengths. (The child is confronted by a series of pairs of unequal lines, and this is then followed by a series in which the lines are equal, and he is asked which are the longer. The test is passed if he recognizes the equality of the second series.) (5) Explains an incomplete account of some incident—*e.g.*, "My neighbour has been having strange visitors. He has received one after the other a physician, a lawyer, and a clergyman. What has happened in his house?"

Fifteen Years.

(1) Interprets an impressionable picture. (2) Interchanges hands of clock—*e.g.*, if 6.20, what would the time be if hour and minute hands were interchanged? (3) Writes in a simple code which has previously been explained to him. (4) Gives the opposites to a list of words supplied.

Adult.

(1) Cutting paper. (2) Reversed triangle. (3) Gives differences between pleasure and honour, poverty and misery, anger and disdain, etc. (4) Gives the differences between a King and the President of a Republic. (5) Gives the sense of a selection which has been read to him.

In using the above tests, the pupil is first examined in that designed for his age, and this is followed by those above or below, according to his competence or incompetence. All questions under any age must be answered to pass that age, and the experimenter records, not only whether the child passes or fails, but the nature of the response in detail.

De Sanctis' Tests.

These consist of five wooden balls, 50 millimetres in diameter, painted red, orange, yellow, blue, and green, respectively; three wooden pyramids; two wooden parallelepipeds; a set of twelve cubes varying in size from 10 to 80 millimetres; a small black cube; test-card of forms; stop-watch, and a cloth cover. The general method of procedure as followed by Dr. Goddard consists in requiring the pupil to select from a mixed heap blocks similar to those which he is shown; to compare those shown to him with those depicted on the test-card of forms; to denote with a pointer all those on the test-card which are similar; to count them, and to compare their size, etc. In each test the time of response is noted, and the answers recorded verbatim. De Sanctis considers that they are chiefly applicable to children between seven and sixteen years of age, and claims that, whilst inability to pass the two simplest tests indicates a high degree of mental defect, ability to pass all six tests in normal time indicates normal intelligence.

CASE-TAKING.

Our present knowledge of medicine is largely due to systematic case-taking, and our knowledge of psychiatry will be chiefly advanced by the same means. Apart from its scientific value, however, the examination of the mentally deficient involves inquiry into so many points that some are certain to be overlooked if method is not employed; whilst the legal relationship of such persons renders it essential that the results of the examination should be carefully recorded and preserved. It follows that in dealing with this class systematic case-taking is a necessity, and for this the first desideratum is a suitable form. That printed on pp. 471-474 is a slight modification of one which I devised some years ago, and which I have found well adapted for ordinary clinical work. It is printed

on a double sheet of foolscap paper. On p. 1 are given the name, address, sex, and age, of the patient, the remainder being left blank for photographs, handwriting, etc.; p. 2 is devoted to the previous personal and family histories; p. 3 to details of the examination and diagnosis; whilst p. 4 is left blank for remarks as to the progress of the case. The method of case-taking will be best shown if I describe the manner of filling up one of these forms.

A. **Previous Personal History.**—Having noted the name, address, sex, and age, of the patient, the first thing to do is to ascertain the previous personal history from the person who has brought him. This should, if possible, be a relative, and preferably a parent; and it is advisable to take it first, not only because it may afford valuable indications as to the line of the future examination, but because the patient, who is sitting on a chair in the room, is meanwhile growing accustomed to the examiner and his surroundings, and will be more at his ease when such examination is made. The first three questions call for no comment, but they are very useful, and should never be omitted. Under *physiological development* information should be noted as to teething, the age at which the patient began to walk alone, to talk, was clean in his habits, and when puberty appeared. The *medical history* includes particulars of any serious illnesses or accidents, with the ages at which they occurred, together with a note as to the general state of health—*i.e.*, Has he been delicate, or strong and robust? Inquiry should be made as to fits, and if the child is alleged to have received a head injury, sufficient details should be ascertained to show whether this was of a trivial or really serious nature. Under the heading *school history*, note the age at commencement; whether attendance was regular or irregular; the kind of school, whether public or private, board or special; the age at leaving, and the form or standard attained. The parent will often volunteer the statement that the subject could never learn at school, or that constant illness or errant behaviour have stood in the way of regular attendance; and statements of this kind should be noted. The general *behaviour and disposition* will be elicited by running through the list given and striking out those which do not apply. A record of the patient's *abilities* is of very great importance. All employments that he has had should be stated, with the amount of wages earned. It is also valuable to note the presence of any special aptitudes or tastes.

B. **Family History.**—The taking of an accurate family history is a most difficult and tedious process, and if the examiner merely asks whether insanity, epilepsy, or other morbid conditions are known in the family, he will almost certainly be met by a prompt and possibly indignant negative. There is only one way for the physician to ascertain such history, and that is, first to gain the confidence of the informant, and then to inquire into the life-history of every member of the family seriatim. If he has been tactful and sympathetic in his inquiries regarding the condition of the patient, the first point will probably have been gained, and he has now only to proceed systematically from generation to generation. I think it is better to begin with the brothers and sisters of the patient, and my own rule is not merely to record every live birth, but every pregnancy, in the order in which it occurred. If miscarriage took place, the period should be stated; if the child is living, a note should be made of its physical, mental, and social condition; if dead, the age and cause of death must be stated—in fact, the aim of the examiner must be to obtain as full details as possible of each individual. In doing this he will be wise to require facts and not opinions. For instance, the mother may allege that a child at school is quite all right, but further questions reveal that he is two years behind his standard; whilst another may be declared to be quite well and strong, and yet further inquiry show that it is being treated for tubercular glands. Having completed the patient's brothers and sisters, the physician then passes to the parents, then to their brothers and sisters and their children, and then to the grandparents. Points to which attention should be particularly directed are the presence of insanity, epilepsy, amentia, marked eccentricity, paralysis, apoplexy, crime, pauperism, alcoholism, tuberculosis, etc. It may, of course, happen that all these details cannot be given until other members of the family have been consulted, and then the history must be completed on a subsequent occasion. It may happen that they are unobtainable, and then the history must remain incomplete; but, even so, the details which have been elicited may be of considerable value in the diagnosis of that particular case, although they may be incapable of use for statistical purposes.

C. **Present Condition.**—Under the heading *general appearance*, it is very useful to note, in a short, concise sentence, the chief features of the patient as they strike the physician. Thus, such

statements as, "*An ill-developed, ungainly youth, with a scowling, furtive expression and restless habits*"; or "*A short, fat, smiling young woman of childish expression and unconcerned demeanour*"; or "*A boy of twelve years, but only looking eight, cannot sit or stand still, constantly chattering and grimacing*," give a general impression of the case, which not only help to recall it, but which may be of considerable value. Under *physical condition* must be noted height, weight, general development and nutrition, skull measurements (the method of taking these has been described on p. 139), the presence of developmental anomalies and stigmata of degeneracy, and any signs of ill-health or disease. The physician next proceeds to the *mental examination*. If time permits, he may apply seriatim the "mental tests" which have been described in the preceding section; but if more experienced, he will usually derive information of equal value by the simpler methods of examining the patient's range of information and his ability to reconstruct dissected pictures in the manner already referred to. Any special defect which is thus revealed may then be further examined by the appropriate psychological test. The results are recorded under each heading with the signs + (in excess) − (in defect), O (normal); but a statement should always be made as to the test used, and what the patient actually does. For example, under the heading *attention* would be noted: "(—), played with picture squares for a few seconds, and then went to look out of window, then picked up ball from floor, threw it away, and snatched book from table." Many of the patient's *capabilities* will have become evident from the mental examination—for instance, his ability to read, write, and sum; but it is useful to tabulate these separately, and to include a note as to his general capacity for occupation and employment. Information on this point may have to be obtained from external sources, but it is often a very good plan to get the patient to describe in detail how he would set about doing some particular task of which he is said to be capable. Finally, the *diagnosis* arrived at is entered. If the patient is an ament, the degree should be stated, together with a short statement of the evidence upon which the classification is made.

CHAPTER XVIII

DIAGNOSIS AND PROGNOSIS

In view of the legal status of persons suffering from mental defect, the diagnosis of this condition is probably the most important, and in some instances may certainly be the most difficult, matter which the practitioner is called upon to undertake in regard to this class. In many cases it may be his only duty, since care and treatment will usually be relegated to the medical officers in charge of schools, homes, and institutions specially adapted for this purpose. In other cases, however, particularly children, his duties may embrace a wider scope, and he may then be expected to answer three questions: *Firstly*, Is amentia really present? *Secondly*, To what extent can it be improved? *Thirdly*, What is the form of treatment to be adopted? These three matters of diagnosis, prognosis, and treatment will be dealt with in the present and succeeding chapters.

DIAGNOSIS.

The diagnosis of amentia may most usefully be considered at three periods—namely, during *infancy*, *childhood*, and *adult life*. At each of these stages there are conditions with which mental defect is more particularly liable to be confused, and from which it has to be differentiated.

Diagnosis in Infancy and Early Childhood.

In infants the symptom which usually first attracts attention, and which causes the parents to seek advice, is the presence of abnormal nerve signs. Briefly, there is either a state of torpid, listless indifference, so that the child makes no attempt to suck, does not look about him, does not cry, and, in fact, is generally lacking

in spontaneity; or the reverse of this condition is present, the child being abnormally restless, always crying and tossing about, and getting hardly any sleep. In cases of *severe* amentia, one or other of these states is generally present during the first twelve months. The latter, however, attracts most attention, for mothers are inclined to look upon the former as merely an excessive amount of "goodness," and, at first, to congratulate themselves accordingly.

But these conditions, although abnormal and indicative of brain disturbance of some kind, are not diagnostic of amentia. They may result from inadequate or improper feeding, causing general malnutrition, or from some more serious bodily disease. The first care of the physician, therefore, must be to make a thorough physical examination of the child, and particularly to exclude such morbid states as anæmia, rickets, malnutrition, bone caries, the various forms of tuberculosis, otitis, meningitis, cerebral abscess, and reflex causes of nervous irritation.

Having done this and ascertained that there is no bodily condition responsible for the nervous abnormality, he has still to decide whether he is dealing with a child preternaturally dull and stolid, with one unduly excitable and neurotic, or with one who is really mentally deficient. Here the family history and the presence of stigmata of degeneracy or features peculiar to certain varieties of amentia will be of great value.

If with either of these abnormal nervous states there is associated a pronounced morbid heredity, there is a strong probability that the child will turn out to be mentally deficient. If stigmata of degeneracy are present in addition, this probability is greatly increased, and a diagnosis may thus be possible in the early months of life. If special features exist, such as the abnormally small skull of the microcephalic, the peculiar physiognomy of the Mongol or cretin, the changes in the fundus of infantile cerebral degeneration, or even marked paralysis, the diagnosis may be made with certainty.

But even if stigmata be absent, and the child's condition be plainly due to brain disease without neuropathic predisposition, it must still be remembered that serious disease of the brain occurring in early life may give rise to secondary amentia, if death does not previously end the scene; whilst this possibility is greatly increased by the presence of morbid heredity. The association of continuous

epileptic convulsions with any of these conditions greatly adds to the unfavourable outlook as to the future mental development.

In cases seen somewhat later—say during the third or fourth year—there is less difficulty in arriving at a diagnosis. Not only is there the great advantage of a longer life-history, and consequently more information forthcoming as to general behaviour; but, since by the age of three or four years the normal child has made considerable intellectual advance, the arrears of the mentally deficient one at this age are by contrast much more apparent. Dr. Ashby says that, provided there is no auditory defect, marked slurring or baby language in a child of five or six years is almost always associated with subnormal intelligence. Idiocy, imbecility, and pronounced feeble-mindedness can now hardly fail to be detected, and the only difficulty experienced will be with regard to the mildest degrees of intellectual or moral defect. It is still necessary to remember, however, that amentia may be simulated by bodily ill-health or disease, as well as by delayed development or dullness of intellect not amounting to defect.

Diagnosis during Later Childhood and School Age.

The conditions which usually give rise to a question of possible mental defect at this age are either inability to learn at school or marked perversity of conduct; very often the two are associated. The condition with which amentia is most readily confused is scholastic backwardness due to causes other than defect. This backwardness, or mental retardation, is such a frequent and important occurrence among school-children that it is necessary to give an account of it before considering the question of a differential diagnosis. It may be remarked that parents not infrequently resent a diagnosis of mental defect, and in the case of children attending a public elementary school it has sometimes happened that the school medical officer has been called into court to convince a magistrate of the accuracy of his diagnosis before the child's attendance at a special school could be enforced, and the diagnosis of defect has not always been sustained.

Mental Retardation.—Backwardness in mental development may be noticed long before school age; but since it is usually in school-children that it first begins to attract serious notice, and to become a problem of practical importance, it is during this age that we shall consider it. Children attending school (excluding the

mentally deficient) may be divided into four classes—namely, *bright*, *fair*, *dull*, and *backward*. These terms are used with reference to their general ability in the ordinary school work; thus, "bright" children are those who master the lessons prescribed by the curriculum for their age and form or standard with ease; the "fair" are the ordinary average members of the class; "dull" children are those who keep their place in the standard, but do so with difficulty; whilst "backward" children are those who are behind the average standard for their years. The relative proportions of these classes varies greatly in different localities, and the absence of any definite standard of comparison, together with the number of personal equations involved, render official figures of little value as an indication of their incidence. Probably, however, we shall not be far wrong in stating that the dull and backward groups together comprise about 10 per cent. of the public elementary school population of the country, this proportion varying from a minimum of 5 per cent. to a maximum of 15 to 20 per cent. in different situations.* It is an interesting fact that the proportion of backward boys is higher than is that of girls.

Dull and backward children, therefore, compose a very considerable section of the school population, and they form that class in whom mental development, from the scholastic standpoint, may be looked upon as retarded or defective. But closer inquiry shows that the class is in reality a very heterogeneous one, and my observations of a very large number of these children have caused me to divide them into two chief groups, according as to whether the backwardness is the result of innate or acquired conditions. These may briefly be referred to.

GROUP I—*Innate Dullness*.—These children are usually sturdy, well grown, and in good physical health; but they have no capacity for book-learning, and the teacher finds the greatest difficulty in teaching them the most elementary abstract rules. Occasionally they may shine in some one particular subject, but this is excep-

* In Somersetshire, in 1905, I found the ratio of dull and backward children varied from 5 to 20 per cent. of the school population in different localities.

Dr. Duncan Forbes found that of 6,318 school-children at Brighton in 1912 the proportions were as follows (both sexes): Bright, 55·5 per cent.; fair, 34 per cent.; dull, 8·1 per cent.; backward, 2·2 per cent.

Dr. Goddard found that of 2,000 American school-children whom he investigated 78 per cent. were "normal," 4 per cent. were gifted beyond the normal, 15 per cent. were backward, and 3 per cent. were mentally defective.

Pedagogical Seminary, June, 1911.

tional, and in most instances there is the greatest distaste and inability for all kinds of school work. They are the children who, in former years, spent most of their time in a corner of the classroom, decorated with a sugar-loaf cap and a slate, on which was inscribed the word "Dunce." In my experience they are commoner in country villages than in towns, and they are often the descendants of generations of agricultural labourers, who have done excellent work with their hands, but very little with their heads. I have seen instances where children, parents, uncles, and aunts all belonged to the same type, and there is no doubt that in very many cases the failing is a family one—it is, in fact, inherited.

During a conversation on this subject which I had with an intelligent old dominie of a country school, he produced an excellent example in three members of one family who were present in school at that time, and who were such hopeless dunces that their attendance seemed a complete waste of time. My informant told me that the father of these children, and *his* brothers and sisters, had all been through his hands in their turn, and they were just the same; but although the father could only manage to scrawl his name, and could not read the newspaper, he nevertheless worked a small farm with complete success. Children of this kind occur in the towns also, and although they cannot or will not (I think it is a little of both) make any headway with their lessons, they are as sharp as needles on the playground and in the streets.

As further examples of this form of school backwardness, I may mention the case of two brothers, aged ten and twelve respectively, who, during my examination of a large country school, were produced by their teacher as being very bad cases of mental deficiency. They were both in Standard II., and my examination showed that they were certainly unequal to the work. But I soon found that they had a very good knowledge of many details of country and farm life—of the cows, the corn, and the bird-nesting—and that they were by no means backward in the playground. In fact, I had little difficulty in demonstrating to the teacher that, although these boys could hardly do the simplest sum, and could only read and write words of one syllable, yet they had plenty of common sense, and were by no means mentally deficient.

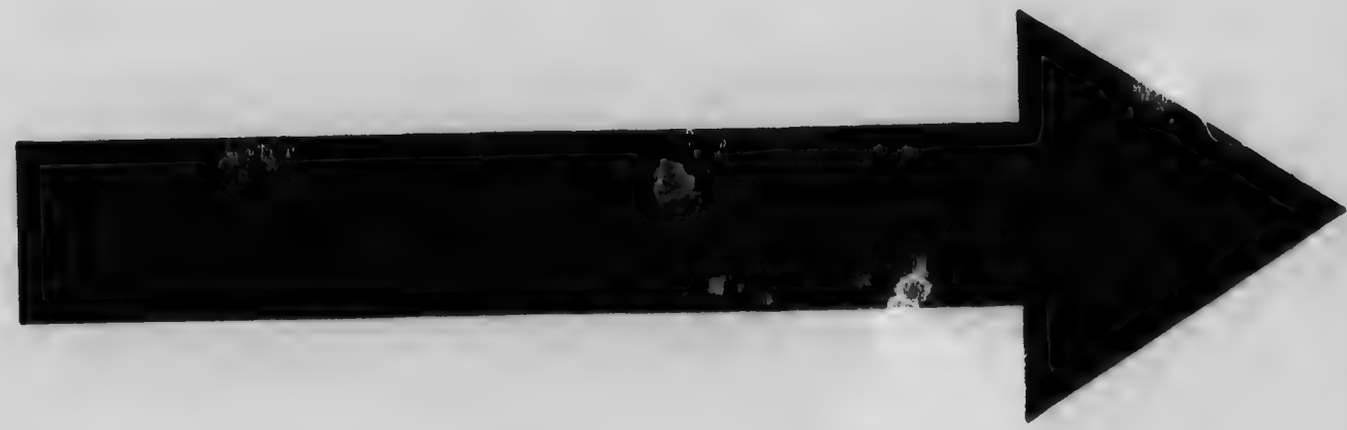
Another child of this kind whom I recently saw, a girl, aged twelve years, who, on account of her age and size, had been moved up to Standard V., told me that David was the son of Goliath, and

that he married Rebekah. She could give me no information about India, except that it was a country somewhere. She could write a passable hand, but her spelling was bad, and her arithmetic execrable. And yet she was by no means a fool in other matters. She could clean out a room, could wash and dress the younger children, and could cook the dinner with very little help. I have small doubt that, unless her father apprentices her to a dressmaker or a typewriting agency, or some other superior employment now in vogue for "young ladies," for which she is quite unsuited, she would make an excellent domestic servant.

It is possible that some observers would consider this condition to be one of mild, but none the less real, mental defect. I do not think, however, that such persons should be so classed. Their family history is generally good; they are sturdy, well grown, free from stigmata of degeneracy, and fully up to the average in every faculty except ability to acquire book-learning. It seems to me that they are perfectly normal, and not diseased specimens of mankind, and that their condition is simply one of a somewhat tardy evolution of certain faculties, the result of the manner of life of generations of ancestors. The term "mental deficiency," in my opinion, should be restricted to those persons who are so lacking in general mental capacity, in common sense, that they are incapable of subsisting by their own unaided efforts. No doubt book-learning is a valuable asset under present-day conditions, but it is not essential, and there are very many individuals who, although scholastically dunces, have yet sufficient aptitudes of other kinds and, in particular, sufficient common sense, not only to take care of their interests, but to achieve a considerable degree of success in a humbler walk of life.

The conditions of word-blindness and word-deafness, which have been described on p. 134, may also be placed in this category of school backwardness due to innate causes. It is also necessary to remember that a number of children exist who mature later than do the average, and who, on that account, may be thought to be defective. Several men who have subsequently attained to considerable eminence have been of this type.

GROUP II—*Acquired Dullness.*—The children in this group differ from those in the preceding, in that their innate potentiality for school work is good; but their mental development has been hindered, and a varying degree of dullness and backwardness pro-



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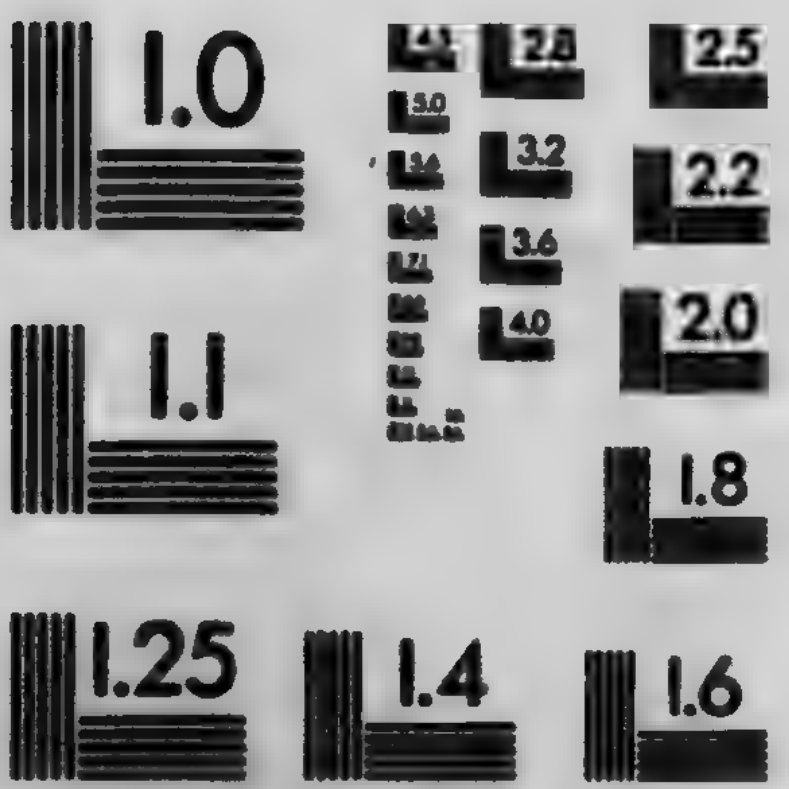

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duced by malnutrition, illness, or disease. Unlike the former, the condition is much commoner in our large towns than in the country, and it often simulates real amentia so closely that for a time a diagnosis may be impossible.

It has already been stated that certain factors of the environment may possibly, but very occasionally, produce mental defect. More commonly, however, the insufficient and improper feeding, the absence of fresh air or warmth, and the general neglect which unfortunately attaches to the early life of many of the children in our densely populated industrial centres, produce a retardation of mental growth which is not permanent, and is not therefore amentia. In real amentia there is either an actual and permanent arrest or an incapacity for perfect development, owing to a blight of the seed. In these cases it is the soil which is unsatisfactory, and the condition may not inaptly be compared to the late opening of the flower-buds in consequence of chill winds and absent sun. It is what may be described as a late spring, and the characteristic of these cases is that under more congenial surroundings the brain rapidly recovers, and the child soon regains the normal standard. It may be several years before this change takes place, and it often does so with surprising suddenness; so that the child who has hitherto been dull, vacant, and apparently suffering from undoubted mental deficiency, astonishes everybody by suddenly waking up.

In other instances the same result is brought about by illness or disease of a more definite and tangible character. The chief morbid conditions which may thus produce a mental hebetude simulating defect are anæmia, tuberculosis, adenoids and enlarged tonsils, defective vision, and deafness; and a child so suffering may rapidly fall behind those of his age in school work. Under the present system of medical inspection the cause of such backwardness is not very likely to be overlooked, but school teachers may readily fall into error, and I have had boys and girls produced as cases of serious defect who merely wanted the attention of the oculist or nose and throat specialist, or who have been suffering from pulmonary tuberculosis. At the same time the presence of disease of this kind does not, of course, negative mental defect.

Another condition, not uncommonly seen in the consulting-room, which may give rise to a suspicion of amentia, is that of nervous exhaustion. The child is dull, listless, and inattentive.

He cannot be got to answer questions, and if given a simple sum he does it wrong. His co-ordination is imperfect, his memory is faulty, there is often tremor, his head may be small and asymmetrical, and his lower eyelids are baggy and relaxed. The history will generally show that the mental hebetude is of recent origin, and that previously the child has been of ordinary, sometimes unusual, brightness; but as against this the inquirer may elicit a neuropathic family history. The condition here is probably one of neurasthenia in a child with but a small reserve of nerve force. It is often accompanied by severe headache, and is usually the result of overpressure. These children form the class from which a considerable proportion of the insane population is drawn, and although most cases recover under suitable treatment, the dullness of mind occasionally persists until the child becomes a complete mental wreck. In older children this state may owe its origin to masturbation. Epilepsy, also, may give rise to a very considerable degree of backwardness in school work, and this may escape detection for some time, owing to the fits being nocturnal and unknown to the parents. The presence of loss of memory, with alternating brightness and stupidity, is very suggestive, and the probability is further increased if there is a history of bed-wetting; but it is only by continuous observation of the child at night that the cause can be discovered with certainty. Here, again, it is necessary to remember that epilepsy and mental defect may, and frequently do, coexist, and that, even if no amentia is present, it is very likely that dementia will supervene.

Insanity might possibly be confused with mental defect, but the relative rarity of this condition, and the usually evident fact that the child is suffering from a disorder, and not an arrest of mind, ought to prevent such a mistake.

The diagnosis of mental defect from the conditions we have just described must be made from a careful study of—(1) The previous personal history of the child; (2) the family history; and (3) his present physical and mental condition.

In investigating the *personal history*, inquiry must first be made as to whether the backwardness can be accounted for by late commencement or irregular attendance at school. If the child started at the usual time, has attended regularly, and his general conduct has been good, it follows that the backwardness must either be

the result of innate or acquired dullness or of mental defect, and the next point is to ascertain whether it is of recent or long standing. If recent, it will, in all probability, be found to belong to the class of acquired dullness due to ill-health or disease; although it is necessary to remember that some cases of primary amentia (delayed or developmental amentia) do not become sufficiently pronounced to attract attention until the advent of some comparatively slight illness or mental stress, and school work may supply this stress. It may also happen that the case is one of secondary amentia, due to some serious toxic or vascular lesion of the brain, but of such occurrences there will usually be a clear and definite history. If the backwardness is not due to any of these causes, the condition may be one of innate dullness or of mental defect.

In most cases of primary amentia it will be found that some dullness or peculiarity has been noticed from infancy, and a careful inquiry into the life-history of the child will usually show that there has been a general retardation of physiological development, such as lateness in cutting his teeth, in sitting up, in attempting to stand, to walk, and to talk (see table of normal developmental data, p. 466). Delay in any one of these particulars is of little importance, for the range of normal variation is very considerable; but delay in several particulars, provided there is an absence of bodily disease, such as rickets, etc., must be regarded as very suspicious, especially if accompanied by a neuropathic family history. On the other hand, the child whose backwardness in school is not due to mental deficiency, but merely to the innate dullness for scholastic work which I have described, will usually be found to show none of these features of retarded physiological development.

The next matter to inquire into is the *family history*. In many instances it may be impossible to elicit more than the most fragmentary account, but where a tolerably good history is obtainable, it may be of the greatest value in helping the physician to arrive at a diagnosis. In secondary amentia there is no neuropathic inheritance; such cases, however, will be made clear by the previous personal history. On the other hand, a family history of insanity, epilepsy, amentia, or other neuropathic state, occurs in such a large proportion of primary aments that their presence or absence is an indication not to be neglected.

The third point to be considered is that of the child's *present condition*. The methods of examining and recording this have

already been described, and the question now before us is as to the inference to be drawn from the results so obtained. At this point I would again warn the physician against looking upon psychological tests as automatic registers of the presence or absence of mental defect. Rightly used and interpreted, they are of the greatest value. They may show that the child is not up to the usual standard for his age in respect of certain mental processes; they may reveal the presence, not of a general backwardness of development, but of a marked inferiority in respect of certain particular mental functions, and thus show that the child's mental development is irregular; and this, to my mind, is a still more important indication. But the physician must know how to interpret these tests, and he must also carefully consider the family and personal history if he would arrive at a true conclusion as to the child's innate potentiality for development and the presence or absence of mental deficiency.

In children of school age the diagnosis of mental defect cannot always be made with certainty, and, as a matter of fact, the return of a considerable proportion of certified "mentally defective" children from the special to the ordinary schools shows very clearly that errors are frequently made. Diagnosis, in fact, is an art which cannot be taught, but only acquired by experience and close observation of mentally defective persons, and the physician who has the largest experience, the keenest powers of observation, and the best judgment, will be the one whose inferences are more often correct, and whose mistakes are fewest.

The important point for diagnostic purposes, therefore, is to know what inferences may be drawn from the facts disclosed by examination of the patient. With regard to the child's physical condition, if he is suffering from deafness, errors of refraction, adenoids, marked anæmia, malnutrition, or other serious disturbance of the general health, and if with this the previous history shows no general physiological retardation and the family history no marked neuropathic inheritance, it is a justifiable inference that his mental dullness is caused by his bodily condition, and is not due to a fundamental incapacity for development. It is true, as I have already pointed out, that bodily disease does not negative mental defect; but if this latter be present, there will usually be some indication under the two other headings mentioned.

On the other hand, if the child's physical condition is good, his

mental reactions must then be closely scrutinized, with a view to ascertaining whether there is anything which would indicate gross irregularity of mental evolution or subnormal potentiality for development. These two conditions constitute the essential characteristics of the defective mind, and if they are present, the inference is justified that some cause is at work militating against complete mental evolution. If defects are revealed in the family and previous life-history, the inference becomes a tolerable certainty.

Irregularity of, and diminished potentiality for, mental development may be shown in many ways. In one child it may happen that, although the application of tests reveals a power of judgment greatly inferior to that of the average child of similar age, together with, it may be, a defective association, poor attention, and but little memory for a sequence of events, the child can yet hum a tune which he has only once heard, repeat rhymes, or remember particular dates and isolated occurrences, with extraordinary fidelity. Another child, whilst regarded by his teacher as dull, may do a passable examination paper on facts which have been dinned into him, he may even shine in some one subject, such as history; but he is quite unable to put together a dissected picture in its proper order owing to defective judgment. In all cases of this kind we have evidence that the backwardness is accompanied by marked irregularity, and that the developmental potentiality of certain portions of the brain is subnormal. It is only by his clinical experience, acuteness of observation, and powers of deduction, that the physician will be enabled to decide whether the imperfection is of such a quality and quantity as is likely to prevent the child when grown up from so adjusting his conduct and mode of life to his environment as to be capable of maintaining an existence without supervision. It was said, "He that is faithful in that which is least is faithful also in much," and although the nature of the adaptation required of the child is very different to that required of the adult, it is improbable that a child who is so lacking in common sense and general intelligence as to be unable to hold his own amidst any of the interests of childhood will develop that ability when adult life is reached.

Mentally Defective Children and Imbeciles.—Having come to the conclusion that the mental condition of the child under examination is not due to disease or ill-health, is not merely "dullness and back-

wardness," but is one of deficiency, the physician who is examining for the purpose of certification to a special school will be required to exclude imbecility. In pronounced cases of this latter there will be no difficulty, but in the milder degrees a differential diagnosis will be far from easy. The following points may be found of assistance :

As a rule the mentally defective school-child knows the names of common objects, and can give some account of their use, whilst the imbecile of corresponding age is generally lacking in this knowledge. Neither child may know his letters, but the mentally defective will usually recognize and name various articles shown to him in pictures. Speech is often a valuable indication, although it is to be remembered that many merely feeble-minded children speak exceedingly badly. It is rather the matter than the manner of speech which must be attended to, as showing the degree of general intelligence. Some imbeciles will repeat questions; others obviously fail to understand what is said to them; others ramble on in an utterly nonsensical manner, and are quite incapable of carrying on the simplest conversation. The inability to execute some simple command or the manner of doing so often affords most useful information. Above all, however, the imbecile is markedly deficient in common sense. He can rarely be depended upon to perform any simple errand or task unless watched the whole time, and he will often sit outside in the rain and get wet through without making the slightest effort to shelter.

Diagnosis during Adolescence and Adult Life.

The diagnosis at these ages is usually a matter of less difficulty, for the reason that a longer life-history is available, which will supply important information as to the person's actual capacity in the management of his affairs and of his general competence to exist without supervision. Among the wealthy classes, or where property is concerned, such cases may form the subject of a legal inquiry, and the greatest care must be taken in arriving at and stating an opinion. This also now applies to persons coming within any of the six categories of Clause 2 of the Mental Deficiency Act who may require to be examined for certification and detention in an institution.

The question of the diagnosis of idiocy and imbecility needs no comment, for it will readily be made from the description of these

states which has been given in preceding chapters. Practically the only difficulty will be in regard to cases of the feeble-minded degree of defect and of moral imbecility. These we shall now consider.

The feeble-minded adolescent or adult has to be differentiated from the lowest grade of the "normal" population, and from certain forms of mental perversion or dissolution. With regard to the lowest intellectual stratum of the normal class, there is no doubt that, in spite of the money and time spent upon their education, a very large number of persons exist whose scholastic acquirements are of the most limited description, whose powers of comprehension are small, and whose reasoning capacity is of a very low order. They are the hewers of wood and the drawers of water, and even these simple tasks are at times not over-well performed. Nevertheless, they stand widely removed from the feeble-minded in that they possess sufficient of the grace of common sense to look after their interests without supervision.

The questions which have to be answered are two—namely (1) Does this person require care, supervision, and control, either for his own protection or for the protection of others? and (2) Is such care necessitated by reason of mental defect from birth or from an early age? If these can be answered in the affirmative, the individual is a mental defective within the meaning of the Act of 1913.

These answers can only be given after a careful consideration of the data regarding his previous personal history, his family history, and his present condition, to which I have already referred; but I think if this be done there will rarely be any great difficulty in arriving at a decision. It is obvious that the previous behaviour of the patient, the manner in which he *has* adapted his conduct to his environment, is a matter of the utmost importance, and inquiry on this point should be most thorough. If the information for any reason is inadequate, it may often be supplemented, and his defect demonstrated, by requiring him to perform some special commission, or by means of the tests which have been described in the preceding chapters.

Consideration of the data revealed by the three lines of inquiry which have been described will also usually avail to distinguish mental defect from mental perversion or insanity. In regard to this, it may be stated that the practitioner must be upon his guard

against attaching too much importance to the presence of delusions. It is to be remembered that whilst delusions are common both in insanity and dementia, they may also occur in aments. In fact, insanity with delusions is a not infrequent complication of mild mental deficiency. Similarly, an alternating emotional state suggestive of a mild form of manic-depressive insanity is frequently observed in the mentally defective.

A person who recklessly distributes his possessions or impoverishes himself by expending large sums of money on objects for which he has not the slightest use, under the delusion that he is acting as the almoner of the Almighty or is the richest man on earth, is probably insane or demented. But if he does these things in consequence of an inability to realize the value of money, and his purchases are such as would only bring delight to a child; if he shows a complete incapacity for business management, an undue credulity, and a lack of sense of responsibility; if, further, he is content to be left with the barest necessities of life, whilst his patrimony is plundered by his acquaintances under his very eyes, and if this condition has been present from an early age, he may justly be regarded as mentally deficient.

It is probably with regard to the early stages of dementia that mistakes are most likely to occur, and I have frequently known persons suffering from adolescent or juvenile general paralysis thought to be aments, and recommended for admission into training institutions accordingly. Even if no history is available, the presence of unequal pupils, tremor of tongue or mouth, and increased knee-jerks in the general paralytic should suffice to prevent this mistake. Another condition which may be confounded with amentia is that of dementia præcox, and it must be admitted that the defect of judgment, the childish, stereotyped repetition of words and phrases, the weakness of will, and the diminished sensory capacity in these persons, may produce a picture which, in the absence of any history, may bear some superficial resemblance to primary amentia. But it is only superficial; the sufferer from dementia præcox will show the presence of rigidity, increased reflexes, catalepsy, katatonia, hallucinations, complete loss of emotion, or other signs of that condition; and if the previous history of the patient is forthcoming, real difficulty can hardly arise. It will, of course, be remembered that dementia præcox may supervene in a person suffering from primary amentia.

Moral Deficiency.—Perhaps the most difficult diagnostic problem of all is that of distinguishing between moral deficiency and ordinary criminality—between madness and badness, in fact. I have already remarked that, although many moral defectives also show indications of intellectual defect, this is not so in all, and it is just these cases in which the usual signs of amentia are wanting, that diagnosis is usually called for and is particularly difficult. There is not the slightest doubt that every year many persons are sentenced to terms of imprisonment for offences they were powerless to avoid; there is equally no doubt that the plea of moral defect is often put forward, and accepted, on behalf of persons who should be punished for their acts. The question has already been dealt with to some extent in speaking of criminal responsibility (p. 337), and the description which has been given of the various types of moral deficiency should enable the physician to examine and give an opinion upon most cases of this kind. No hard-and-fast rules can be laid down; each case must be judged upon its merits, and after a careful consideration of the life-history of the individual, his mental status, and all the circumstances attending the commission of the offence. It may be useful, however, briefly to recapitulate the points to which attention must especially be paid.

The early history of the person is of the greatest importance, for the reason that if real moral defect is present, it can hardly fail to have shown itself in disorder of conduct from a comparatively early age. In such cases the examiner will therefore usually find that the child was addicted to lying and thieving, and acts of gross immorality. He may have been dismissed from school because he was found to be generally unmanageable; and it will often be elicited that, instead of showing any contrition for his offences, he looked upon himself as ill-used. Many of these children are very plausible, and although some may evince a certain degree of backwardness in particular directions, they are often precocious in others. There is, to my mind, no doubt that offences may be committed in consequence of an inability to inhibit certain immoral or criminal impulses; but I should regard with grave suspicion any plea of "weak will" which was put forward if the patient had not previously shown evidence of this failing in the shape of other impulsive acts during childhood.

The nature of the offence itself may afford valuable indications.

For instance, the ordinary criminal will steal, or otherwise offend against the law, because of some seeming advantage which outweighs the risk of possible detection. On the other hand, the morally defective person may have no adequate motive at all; he may have no use whatever for the articles he steals; and he will incur punishment upon punishment without being able to desist from his evil practices.

The *moral imbeciles*, as now legally recognized by the Mental Deficiency Act, come within a much narrower scope, in that they are defined as "persons who from an early age display some *permanent mental defect*, coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect." The presence of mental defect must be ascertained by the methods already described, whilst the history will show whether the latter part of the definition is fulfilled.

PROGNOSIS.

Until sixty years ago cases of pronounced mental deficiency were considered to be absolutely and hopelessly beyond any possibility of amelioration. But in 1846 Dr. Édouard Séguin* demonstrated to the world the capacity possessed by many of these persons for considerable improvement under patient and systematic training, and since then the pendulum has gradually swung to the other extreme. At the present day the training of the mentally deficient occupies a more or less important place in the social system of most civilized countries, and it is even questionable if there be not a tendency to overestimate the educational possibilities, and to think that the machine only needs to be sufficiently elaborate for the entering idiot to emerge a person of normal intelligence.

Both these views are wrong, and are to be deprecated. On the one hand, there are comparatively few cases so bad that they cannot be improved to some extent, if only in habits of cleanliness and the curtailing of destructive and dangerous propensities. On the other hand, no case of real amentia (with the possible exception of cretinism) ever becomes *cured*. However mild it may be, some defect will always remain, and this will render competition on an equal footing with the normal population impossible.

* Édouard Séguin, "Idiocy, and its Treatment by the Physiological Method," New York, 1866.

And here it is necessary to enter a protest against the practice adopted by some medical men of telling the parents that the child will "grow out of it," or that he will be "all right when he is seven," or "fourteen," or "twenty-one." In some cases this is done from ignorance of what amentia really is, in others from a benevolent but mistaken idea of sparing the parents' feelings. Where the physical condition of the patient is such that death cannot be long delayed, the disquieting knowledge that idiocy is present may perhaps be withheld; but in other cases the interests of the patient demand that the parents should be told the truth, for much of the early training so necessary for improvement will be in their hands. I have known children dragged about from doctor to doctor and from quack to quack in the vain hope of seeing that change which had been confidently foretold, but which never came. I have known many pounds spent on nostrums, electrical and galvanic appliances, whilst the child was rapidly deteriorating for want of systematic training; but I have rarely met parents who were other than grateful, though sad, when the real truth was kindly told them. Few people like living in a fool's paradise, and in this case it is not a paradise, for there is often the lurking suspicion that something is really wrong, and that the practitioner does not understand the case.

To what extent, then, may the patient be improved by treatment? No absolute forecast can be given, but attention to certain considerations regarding the *form*, *variety*, and *degree* of amentia will enable a tolerably accurate prognosis to be given in most cases.

Prognosis of the Forms of Amentia.—As a rule cases of primary amentia are much more capable of improvement than are those of the secondary form. In other words, contrary to what would be expected from their appearance, the stunted, misshapen, and often repulsive-looking victims of morbid heredity are more responsive to training than are the well-grown, and often well-favoured, sufferers from accidental injury or disease of the brain. This dictum was enunciated by Langdon Down many years ago, in the words that the prognosis is favourable "inversely as the child is comely, fair to look upon, and winsome," and experience has fully confirmed its general truth. The explanation of this apparent anomaly is that in the latter group we have to do with destructive lesions, whose course is often progressive, and which, by inducing

a general disturbance of the whole [illegible] of the brain, make education impossible. In the former, on the other hand, although neuronic development is irregular and incomplete, there is often no actual disease.

Prognosis in Different Varieties. — The foregoing statement, however, is not rigidly exact, for the result is to some extent dependent upon the *variety* of amentia present. The prognosis of the respective varieties may be summarized as follows:

In *simple primary amentia* the result is hopeful or the reverse in proportion to the degree of deficiency and the presence of epilepsy or paralysis.

In *microcephalics*, with the exception of extreme instances, a considerable amount of improvement may be predicted, and the patient may even finally become capable of many simple routine tasks not requiring thought. But he will always be markedly deficient in mental capacity.

In *Mongolians* the prognosis is, generally speaking, directly proportionate to the intensity of the bodily signs. The milder cases, as a result of appropriate training, may almost come to pass muster with their brothers and sisters; but they will always require someone to manage their affairs. Many of the more pronounced cases, even, can be taught to do some useful work in the garden or on the farm. But the actual performance of Mongolians never comes up to what might be expected from their vivacious and often comparatively intelligent appearance.

In cases of *secondary amentia due to toxic or vascular disease of the brain*, the prognosis, as already remarked, is on the whole decidedly less favourable than in primary aments; but it differs very greatly according to the nature of the lesion. In cases where, after the infliction of the damage, the pathological lesion ceases to progress, and serious secondary anatomical changes are not induced, the prognosis is tolerably good, always provided that appropriate training is begun sufficiently early. Many cases of birth injury and purely vascular lesions occurring in very early life are of this nature, and the improvement is probably brought about by neuronic compensation. Many of these persons who suffer from severe paralysis even may be educated to read, write, sum, and do mechanical work with surprising dexterity; but there is usually a little childishness, a want of judgment regarding the affairs of life, and an inability to make headway against competition. Dr.

Shuttleworth* mentions such a case presenting right hemiplegia with athetosis attributed to injury at birth, who was admitted into the Royal Albert Asylum at the age of twelve years. "In spite of his physical drawbacks, he rapidly developed graphic abilities, and after a course of scholastic instruction in writing, drawing, reading, etc., with suitable physical and manual exercises, he was trained to woodwork in the joiner's shop, where he gradually attained such control over his irregular movements that he became an expert workman, making tables, chests of drawers, and decorative sideboards. He showed a nice taste for wood-carving, and ultimately became so skilful in it that he is now employed as instructor in this art. He is also a clever scene-painter. He is now practically ambidextrous, his right hand having been trained to be serviceable."

It is, of course, to be remembered that in many of these cases of birth paralysis the lesion concerns the motor centres of the brain only, the child subsequently appearing, but not in reality being, mentally deficient because his crippled condition has prevented his attendance at school.

On the other hand, in cases where the lesion is active or induces progressive pathological changes, the prognosis is decidedly unfavourable, and in a considerable number dementia sooner or later supervenes. The majority of these are characterized by epileptiform or epileptic convulsions.

Amentia due to epilepsy is decidedly unfavourable, being, in fact, one of the most hopeless varieties. For epilepsy which has produced amentia will probably end by producing dementia. In other cases of mental deficiency, in which epilepsy is a complication and not the cause, it is still a highly unfavourable symptom, and imposes a considerable barrier to successful education.

In *sclerotic amentia* the most hopeful cases are those in which enlargement of the skull takes place. The majority of cases of pronounced sclerosis with crania of normal or diminished size die before, or soon after, attaining the age of puberty.

In *hydrocephalus* everything depends upon the course of the disease, which can never be foreseen. Rapidly progressing expansion of the skull is almost invariably fatal; but in cases where spontaneous arrest takes place, the resulting mental impairment

* G. E. Shuttleworth, "Mental Deficiency in Children," *British Journal of Children's Diseases*, March, 1904.

may be but slight, and may be largely remedied by suitable training.

In *syphilitic amentia*, in view of the tendency to the development of general paralysis, the outlook is decidedly bad, whilst in *infantile cerebral degeneration* it is hopeless.

In *cretinism* the prognosis is on the whole dependent upon the age at which treatment is begun and the persistence with which it is carried out. As already mentioned, however, it is possible that other factors may influence the result—*e.g.*, the presence or absence of morbid heredity.

Amentia due to isolation or sense deprivation is curable provided special education is begun sufficiently early, and even in cases which have been neglected for years it is remarkable what results may follow patient and systematic training.

Prognosis regarding the Degree.—It is obvious that the less the innate potentiality for development, the greater will be the amount of permanent defect. At the same time the results of training are often very considerable, and by this means a child who would in its absence be a helpless idiot may make considerable developmental progress. On the other hand, the child possessing a potentiality which might have been turned to good account may, by neglect in early life, never develop beyond the status of an imbecile or idiot.

CHAPTER XIX

TREATMENT AND TRAINING

I.—MEDICAL AND SURGICAL TREATMENT.

In view of the fact that primary amentia—to which form the great majority of cases of mental deficiency belong—is due to a diminished innate potentiality for development—in other words, to a formative defect of the tissue which constitutes the physical basis of mind—it is hardly to be expected that medicaments would have any remedial effect, and, as a matter of fact, there is no drug which has the slightest direct or specific influence upon this condition. Cases of secondary amentia, however, stand on a different plane, in that in them the mental defect is not due to an innate blight, but to the fact that development has been handicapped or arrested by some external factor, and where this can be overcome by the administration of drugs, a considerable improvement, or even cure, may be brought about.

We have a remarkable and well-known instance of this in the thyroid treatment of cretinism. The future may even show that there are other varieties of secondary amentia which are due to definite glandular defects or particular disorders of nutrition, and for these also the corresponding specific may be found. As I have already mentioned, it is possible that Mongolism, which is now classed as a variety of primary amentia, may eventually prove to have such a causation, and to belong to the secondary group. At the same time the cases which may possibly be treated in this way are few in number, and in the great majority of instances of secondary as well as of primary amentia it must be said that drugs have no direct influence. Extracts from the pituitary, thymus, and other glands have now been tried for a considerable number

of years, with practically no result,* and even the amentia which is directly due to syphilis has hitherto shown not the slightest improvement under antisyphilitic treatment.

The same must be said of surgical treatment. When the theory was propounded that microcephalus was due to premature synostosis, it was natural that the surgeon should suggest relief by craniectomy. During the year 1890, and for a time after, a considerable number of operations were performed by eminent men, chief of whom may be mentioned Lannelongue (Paris), Victor Horsley (London), and Keen (Philadelphia). The cases operated upon were not only microcephalics, but included other varieties of amentia. The mortality was exceedingly high (about 25 per cent.), and those who survived showed no mental improvement. It is not surprising that the operation should have gradually been abandoned by reputable surgeons, and to-day it is practically unheard of. It was, indeed, founded upon a mistaken notion as to the pathology of this condition, and it may be said that to-day operations of this kind upon cases of primary amentia are absolutely unjustifiable. The same must be said of the operation of paracentesis in hydrocephalus.

The case is somewhat different with regard to certain varieties of secondary amentia. Where there is no morbid heredity, and where there is clear evidence, or even a reasonable presumption, that the deficiency is due to fracture, splintering of the inner table, the pressure of a blood-clot, or other conditions causing increased cranial pressure, then not only is operation justifiable, but it is the duty of the physician to advise it at the earliest possible moment, and before changes have been induced which may be irreparable. I must confess, however, that I know of no statistics sufficiently extensive to show the results of operation in such cases.

Nevertheless, it is not to be assumed that medicine or surgery have no place in the treatment of amentia. This is far from being the case, for *mens sana in corpore sano* is a true saying, and medicine and surgery can do much to promote the bodily well-being of these

* Dr. A. S. Woodwark (St. Bartholomew's Hospital Reports, 1912), has recently been using tablets consisting of 1 grain each of thyroid, thymus, suprarenal, and pituitary glands. He found that three Mongolian imbeciles, aged six, four, and two years respectively, to whom these were administered were improved mentally, becoming cleaner, quieter, and more intelligent. But although these results are extremely interesting, the lapse of time and many more observations will be needed before a definite opinion can be formed as to their value.

persons. I am no advocate for the systematic drenching of the ament with drugs, or for the performance upon him of operations which can contribute nothing to the improvement of his body or mind; but it cannot be doubted that conditions are often present which stand in the way of efficient training and which are amenable to treatment; and it is certain that education will be attended with most success when every means have been employed to place the body in the best possible condition.

Before systematic education is begun, therefore, it is of great importance to ascertain the existence of disease, disorder, or deformity, and to correct the same by appropriate remedies, if such be possible. It is unnecessary to describe all the diseases and ailments which may affect the mentally deficient child; their name is legion, and the chief of them have already been referred to in previous chapters. It may be stated, however, that conditions which particularly call for treatment are adenoids, enlarged tonsils, nasal polypi, cleft palate, carious teeth, errors of refraction, disease of the ear, phimosis, hernia, webbing of the fingers, etc. Troublesome contractures may often be relieved by tenotomy, and where club-foot is present, walking may be greatly improved by suitable surgical boots. Asexualization has been vaunted as a remedy for some of the ills of the ament, but although benefit seems to have resulted in some cases, the effects are too contradictory to make it an operation which should be advocated. Medical treatment is called for in anæmia, malnutrition, and many disorders of the circulatory, respiratory, alimentary, and cutaneous systems. Troublesome constipation is best met by attention to the diet and the administration of cascara sagrada. Diarrhœa is often caused by imperfect mastication or unsuitable food, and may need antiseptic or astringent treatment. Extract of malt, with or without cod-liver oil, is valuable in severe malnutrition. Epilepsy is best treated by a careful control of the diet and daily life; but if this fails, the frequency and severity of the attacks are often checked by borax and the bromides. A single dose of the latter at bedtime is often useful in allaying the undue instability so common in many of the milder defectives. Enuresis, a frequent complication, is best treated by accustoming the child to evacuation at regular periods. It may be helped by withholding all fluid for at least two hours before retiring, and in many cases a few nightly doses of one of the bromides will serve to check the habit. I have often found

good results follow a mixture of bromide of potassium and Parrish's Chemical Food; whilst belladonna is another remedy which is often successful. In some cases of enuresis thyroid extract has been used with marked success. The initial dose is ¼ to ½ grain of the dried extract daily, which may, if necessary, be gradually increased until symptoms of thyroidism appear.*

In addition to these indications for special treatment, the food, clothing, exercise, cleanliness, and general hygiene of these persons demand the closest attention. The dietary must be on a liberal scale, but plain, and excess of meat must carefully be avoided. Where mastication is imperfect, recourse to spoon food is often necessary, and this is always the case with the low-grade idiots. The danger of asphyxia from the impaction of food in the glottis is no fancy, and many cases of aspiration pneumonia have been recorded. Attention to the clothing is particularly called for in the Mongolian variety, as well as in other patients prone to catarrhal and circulatory disturbances. In the cold weather, the wearing of gloves may prevent troublesome chilblains. Daily exercising and bathing must always be enforced, and the greatest care must be taken that rooms are sunny, not too warm, and thoroughly well ventilated. The marked predisposition which many of these persons evince to the development of tuberculosis must be kept well in mind.

It is unnecessary to enter any further into the details of medical, surgical, and hygienic treatment, since the principles are the same in these as in ordinary children. The only point I wish to insist upon is that mental deficiency is often—indeed, usually—accompanied by bodily deficiency, disorder, and disease, and that the treatment of these latter is an essential prelude to, or accompaniment of, the training of the mind.

II.—EDUCATION.

General Principles.

Having done our best, by careful attention to the laws of hygiene—aided, where necessary, by medicine and surgery—to remove any likely impediments to training, and to bring the mentally deficient

* On the subject of "Enuresis and Thyroid Extract," see an interesting account of twenty-eight cases by Dr. A. C. D. Firth in *Lancet*, December 9, 1911; also a paper by Dr. Leonard Williams in *Lancet*, May 1, 1909.

child into the best possible physical condition, the question of education must be considered. In the following pages I shall deal with the general principles upon which such should be based, particularly those which concern the physician. The actual pedagogic methods to be employed are beyond the scope of this work, and, for the most part, can only be acquired by practical experience.

Education has a threefold object. *First*, it should develop and cultivate all the latent potentialities of body and mind to their fullest extent; *secondly*, it should repress or eliminate vices and faulty modes of action; *thirdly*, it should supply, if possible, such particular instruction as will fit the individual for some useful form of work. In other words, it should aim at imparting knowledge as well as inculcating wisdom. The two former of these objects are educational in the literal sense of the word; the latter may be looked upon as technical instruction.

The development of mind takes place in consequence of two influences: *spontaneity*, or an inherent tendency of the brain cells to develop; and *stimulation* of these cells by external impressions. The brain of the healthy child has an inherent potentiality which makes it to a certain extent independent of its environment; or perhaps I should rather say that it is capable of utilizing and responding to any surroundings, within ordinary limits, in which it may be placed. A little friend of mine, aged four years, reads "Alice in Wonderland" with remarkable facility. She has never had a single formal lesson, and her knowledge was picked up solely by observing letters and asking questions. The defective mind is lacking in this power. One of its chief characteristics, if not the chief, is a want of what may be termed *mental aggressiveness*; consequently its development has to be aided and encouraged by special means. At the same time, the deficient power of control often gives full play to the lower organic feelings, resulting in vices, antisocial acts, and crimes. These tendencies have to be eliminated.

Until sixty years ago the training of the mentally deficient, where such was attempted, was conducted upon no logical method, and it is to Dr. Édouard Séguin that we owe the first clear enunciation of the principles upon which it should be based. In his words, education "consists in the adaptation of the principles of physiology, through physiological means and instruments, to the development of the dynamic, perceptive, reflective, and spontaneous

functions of youth." By the painstaking and laborious application of these principles, Séguin himself demonstrated the remarkable results which may take place even in apparently hopeless idiots; and upon his principles, extended and elaborated by the work of Froebel and Pestalozzi, most of our present methods are based.

The method of applying these principles, in brief, is to take each "function" or "faculty," each physiological system of neurones, and, by means of appropriate and carefully arranged progressive exercises, to develop them to the fullest extent of their capacity. I do not, of course, mean to suggest that we can isolate and develop separately each "function." All portions of the mental apparatus are interdependent, and education is a general process which simultaneously concerns the development of the bodily as well as the sensory, motor, intellectual, emotional, and moral functions. But it is convenient for purposes of description to make this division, and it tends to emphasize the fact, that as the child's development naturally takes place in a regular progressive order, so must the training be progressively adapted to its growing needs.

In many cases it is first of all necessary to arouse spontaneity. The child is inert, and must even be stimulated to play; until this is accomplished, and some *interest* is aroused, any further training is, of course, impossible. Having succeeded in arousing some degree of initiative by means of romping play, this is gradually replaced by more definite games, and then by orderly drill and calisthenics. In this way spontaneity becomes controlled in accordance with a definite purpose, and the child learns to acquire the habits of obedience and attention. This naturally leads up to still more regular and systematized exercises, in the shape of such kindergarten occupations as building with cubes, stick-laying, bead-threading, pricking outlines, knotting and looping, paper cutting and folding; and these, in turn, are superseded by clay-modelling, macramé work, knitting and darning, and finally by definite technical instruction in wood-carving, carpentry, basket-weaving, mat-making, needlework, laundry work, and dressmaking, etc. Coincidently, speech is cultivated, instruction is given in the three R's, and every care is taken to repress injurious propensities and to develop moral character.

The general principles of education do not differ from those in the case of the mentally normal, the difference being merely one of method and application. The whole object of the teacher is

to reduce the environment of the child to a form which the deficiency of his mind is capable of assimilating, at the same time taking care that his mental pabulum is administered in an attractive shape. It may safely be said that no success will be attained unless the child's *interest* is aroused, and this must be the teacher's first care. It is by means of this interest and its progressive expansion, by gradually leading him step by step from one acquirement to another, that the capacity of the child is unfolded and that his education is accomplished. In many cases even destructive tendencies, where the child will do nothing but tear into pieces everything given to him, may be made use of as the first stepping-stone to manual work. Above all, it is necessary to remember that these children's conception of the abstract is extremely limited, that everything must be presented in the concrete, and that they will learn far more with their hands than with their heads.

It is necessary to pay particular attention to the cultivation of the sensory and motor functions. In the ordinary child these are perfected as the result of his own initiative, but in the ament special stimulation is required—not only because of the presence, in a considerable proportion of these children, of defects and irregularities of nerve action (abnormal nerve signs), which must be corrected before useful manual work can be accomplished, but because such training affords a most valuable means of developing and co-ordinating intellectual activity.

Thus, by means of suitable impressions through eye, ear, skin, muscle, nose, and mouth, the range and delicacy of the sensorium is increased, the brain rendered more receptive, the power of discrimination, as well as motor response, encouraged, and a basis supplied for future thoughts and ideas. We live, of course, in a perfect sea of sights, sounds, and vibrations of every kind, and, as already remarked, the healthy brain is so constituted that it can utilize these without any special tutorial help. I do not say that this is likely to lead to an optimum result; in fact, I believe that the mental capacity of even the healthy child would be greatly improved by a course of sensory training on physiological lines. It is doubtful whether the mental development of anyone, even the best, comes up to the inherent possibilities. In the case of the defective mind, however, such a course of training is usually absolutely necessary, and constitutes a most important part of education.

Similarly with regard to the motor system. All mental action is expressed by movement, or inhibition of movement, of some kind or other. It may be the mere opposition of the thumb and forefinger, the play of facial expression, the complicated mechanism of speech, or the deliberate conformation of the whole being to some emotion or ideal, as seen in conduct and behaviour. Since it is by the character of his movements and actions and general behaviour that the entire relationship of the mentally deficient child to the rest of society will be determined, it is plain that the development of the motor system is of the greatest importance. We may, indeed, say that all means for the cultivation of mental faculty are of importance according as they develop, co-ordinate, and control mental manifestations—*i.e.*, movements.

Such, then, are the general principles upon which the education of the mentally deficient child must be based, and of which some further details will be given presently. It is obvious, however, that although we must be guided by these principles, the measure of success achievable will vary enormously, and will be dependent upon the degree of initial defect—or perhaps I should rather say upon the inherent capacity for development present in any particular case. This cannot be foretold; but undoubtedly there is a limit, and a point is at last reached beyond which no further advance takes place.

In the idiots we shall get no farther than the implanting of habits of cleanliness, the development of some capacity for self-feeding and self-help, the curtailing of destructive and vicious propensities, and the expression, by signs or words, of simple wants. And we may not get even so far as this. In the imbeciles a higher stage will be attainable, and not only may they be made to be much more self-helpful and less dependent, but they may even be taught to perform a certain amount of useful routine work. Lastly, in the case of the feeble-minded the result achieved may be very considerable. A goodly number will become orderly, industrious, and well-behaved individuals, perhaps able to read and write a little, to do simple sums, and capable of performing useful work, which will at the same time keep them happily engaged and, where necessary, contribute to their support. But *cure* will never take place.

We may now refer to some points regarding the application of these principles to home and school training.

Home Training.

The training of the mentally deficient child should begin *at birth*, or as soon as the condition is diagnosed. The ament, even more than the normal child, rapidly develops bad habits, and care in the early years of life may not only do much to prevent these, but will be of the greatest assistance in paving the way for the more systematic training of after-years. This early training must of necessity be carried out at home, and, where circumstances permit, it is advisable that it should be at the hands of a trained governess; but where this is not possible it must be undertaken by the parents. In any case, the growth and well-being of the child's mind, as well as body, should be under the general supervision of the medical attendant.

I have already emphasized the necessity for telling the parents the truth regarding the condition of their child; I would here remark that it is also the physician's duty to state plainly that neglect at this time may mean the development of habits which it may take years to eradicate; whilst care, kindness, and, above all, patience, will certainly result in improvement. Suitable food, clothing, warmth, exercise, fresh air, regular bathing—in fact, attention to all concerning the general bodily health—are of the first importance, whilst the habit of cleanliness cannot be enforced too early. Its acquirement in all but the most degraded idiots is usually only a matter of patience. With regard to training, there is no need for anything elaborate; but the practice of relegating these children to out-of-the-way corners, and of depriving them of those adjuncts to development which they need far more than do ordinary children, is one which cannot be too strongly condemned. What is required at this time is a little more, and not a little less, care and patience. The child must be talked to and encouraged to play. If destructive, it must be gently but firmly repressed. If inactive, its little hands must be made to feel the contact of toys, its sight stimulated by brightly coloured balls, and its hearing by music, or even noise. Instead of depriving it of toys, let it have an abundance to see and handle, and even to break. As it gets older, encourage it to sit up, to stand, and to walk, and do all that is possible to develop and co-ordinate sensory and motor activity. If the child is to be rescued from its solitary position, the time so spent will not be wasted.

I think one of the most deplorable things in connexion with these unfortunate children is the neglect which so often attaches to their early home life. I do not think that this arises from unkindness, for I have often been struck by the manifest solicitude of parents and all those about them. It is simply a matter of sheer ignorance as to what to do and how to do it, but it often results in the development of habits which are ineradicable.

School Training.

Where the home conditions are such that adequate training cannot be obtained, or when such training no longer suffices for the needs of the child, he should be removed to a special training institution. Usually this is about the sixth or seventh year, but in certain circumstances it may be advantageous to remove the child earlier, whilst in others he may stay at home until a later age than this. The milder defectives—*i.e.*, mentally deficient children who are not imbeciles—come within the operation of the Education Act at seven years, and may then be compelled to attend special classes or schools.

School training consists of more systematized methods, having for their object the development of the sensory, motor, intellectual, and moral faculties of the child. It is necessarily less individual than the training he has, or should have, received at home; but this defect is more than compensated for by the spirit of emulation and of companionship which results from association with other children like himself. Moreover, although children in institutions must of necessity be taught in classes, it is still possible, by carefully grading and seeing that such classes are not too large, to insure for each child a sufficient amount of individual attention. The regulations of the Board of Education require at least one teacher to every twenty defective children, but in lower-grade aments the proportion of children must be very much reduced.

As we have seen in previous chapters, aments, with regard to the type of their nervous constitution, are divisible into two main groups. On the one hand there are those who are passive, inert, and markedly deficient in spontaneity; on the other there are those who are restless and exceedingly motile, full of "tricks," "habits," and impulsive acts, and markedly deficient in the power of sustained

attention. In each of these the training is in accordance with the general physiological principles which have already been alluded to—namely, stimulation through the sensory channels—but the method is different in the two classes. The stolid group, whose main defect is one of excitability, require stimulation by means of romping games, musical drill, and vigorous impressions of all kinds. The restless and excitable class, on the other hand, require their excessive movements to be brought under the control of the will by deliberate and systematic exercises, such as are comprised in many of the kindergarten occupations. But apart from these broad differences, mentally deficient children differ enormously in their power of response as well as in the presence of particular defects or irregularities of brain function, and it is the duty of the physician in charge to make a careful examination of each child, and to advise the teacher regarding the appropriate method of training. Individual teaching must still be the keynote, and the teacher must ever be on his guard against neglecting the laggards for the sake of those of more promise.

Teaching is an art which cannot be taught. It must come by practical experience of the management of children. The following brief account simply aims at suggesting some of the chief physiological methods upon which training should proceed. The teacher with a love for his work and his pupils will have no difficulty in adapting, modifying, or extending these to suit the needs of any particular child, always bearing in mind that the chief requirements are the development of what is defective and the elimination of what is faulty.

The Training of the Senses.—The chief sensory organs through which impressions reach the brain are six in number—namely, eye, ear, nose, mouth, skin, and muscle. Probably the training of the first and last of these are of most importance.

By means of *vision*, information is gained regarding the colour, size, and form of objects, and attention should be given to each of these. It will often be found that, whilst the high-grade ament distinguishes the primary colours readily enough, he is unable to separate their shades; and that, whilst he distinguishes between the form of a triangle, a square, and a circle, he fails to see any difference between triangular or quadrangular figures of varying shape.

For teaching colour discrimination, a very convenient apparatus

is a series of cardboard tablets, each 1 inch square, and of a different shade. We may have six or eight shades of each of the colours blue, red, green, yellow, orange, and purple. It is unnecessary that the child should know the names, all that he is wanted to do being to separate the collection of tablets into heaps according to their shade. Subsequently he may be taught the names. Coloured cubes, beads, or wools may be made use of in the same way, and as the child progresses he will find great delight in pointing out to the teachers the different colours in pictures which are shown to him. Later on the kaleidoscope may be turned to profitable account in the development of colour discrimination.

For cultivating the child's perception of form and size, it is first of all necessary to draw his attention to the coarse differences in the many objects of common use. After this we may make use of a similar series of tablets of various size and shapes, but of uniform colour, again getting him to divide them into heaps. "Size," "form," and "peg" boards, as well as the ordinary dissected puzzles of the toy-shops, not only afford valuable visual training, but are also of great use in developing tactile sense and in aiding muscular co-ordination.

The cultivation of the *tactile and muscle* senses is particularly called for in the case of mentally deficient children, since, in addition to its general educational value, these are functions which are absolutely essential for the proper performance of manual occupations, and the future of the ament must depend to a very great extent upon how he can use his hands.

Sensations travel to the brain from the muscles just the same as from eye, ear, nose, etc., and with a little practice they may be appreciated and compared with one another in precisely the same way. These sensations arise in two ways: *firstly*, when a muscle or series of muscles is moved; *secondly*, during the tension of a muscle. Generally speaking, impressions arising during muscular contractions are of use in appreciating size and distance, whilst those coming from muscular tension tell us of weight. Of course, in the actions of ordinary life we make use of several senses simultaneously, and those from muscle are aided by others from skin and eye. In training, however, it will usually be found advantageous for the pupil's eyes to be kept closed during these exercises.

In the inert, unresponsive type of aments, we may have to

stimulate the sensorium by passive movements of the limbs, or by compelling the hands to grasp, to feel, and to let go objects of different texture, temperature, density, and coarseness or smoothness of surface. In the restless and abnormally motile type, control, co-ordination, and attention will be improved by blindfolding the child, and getting him to differentiate between form and size tablets by passing his fingers round their edge. Many mild imbeciles will enter with zest into the game of guessing articles in a bag by simply feeling them. Another excellent method is that recommended by Dr. Warner. It consists in accustoming the child to differentiate between varying weights of shot contained in a small chip-box held upon the extended palm. Miss Mumbray, who has had a large practical experience of the training of mentally defective children, is in the habit of directing her pupils to measure off on a sheet of paper a series of prescribed distances—say from ½ inch to 4 or 6 inches. After a little practice at this they are required to draw lines of specified length *without* the measure. In this exercise the ocular as well as the finger movements are utilized, and the results are not only extremely good in themselves, but are of the greatest value in leading up to kindergarten occupations, Sloyd, and subsequently industrial training.

It occasionally happens that, instead of sensation being diminished, it is so much increased as to become a source of pain. The hyperæsthetic hands must then be employed in rough, coarse work until their sensibility is dulled.

Hearing is often defective in aments, but many of these children are thought to be deaf when the real deficiency is one of spontaneous attention. The best means of developing this faculty is by music. Singing, musical drill, and the concerts of the entertainment-hall, which should form part of the life of all institutions, not only develop the child's power of attention and the range and accuracy of his hearing, but are a source of the greatest happiness.

Where the senses of *taste and smell* are in need of special cultivation, this may be accomplished by placing upon the tongue such substances as sugar, quinine, salt, chlorate of potash, soda, etc., or by getting him to sniff coffee, cocoa, snuff, or various essential oils.

The Training of Movement.—It is impossible to overrate the importance of this. The mentally deficient child who has been taught to walk, to speak, and to dress and feed himself, has obviously been materially benefited—still more so is this the case,

however, when patient and systematic training has enabled him to put his hands to some useful occupation. But a higher result even has been achieved. Mental action and motor activity go hand-in-hand, and in the development of muscular co-ordination lies one of our best means of cultivating self-control and regularity of mental action.

The training of movement in the mentally deficient resolves itself into three processes: (1) The development of action, (2) its co-ordination, (3) the correction of motor anomalies in the form of tricks and habits. These two latter are accomplished by the same means. Speech is also a motor phenomenon, but it will be convenient to refer to it separately.

The Development of Movement.—As we have seen, a proportion of aments are listless, torpid, and inactive. They are quite content to sit still and do nothing, and they even evince no interest in the games of their companions. This condition is usually the result of a general sluggishness of the nervous system, but it is occasionally caused by nervous exhaustion due to ill-health. In the latter, rest, food, and fresh air are necessary; in the former, active and vigorous stimulation is required.

The only means of stimulating the motor cells of such a child is through the sensory pathways, and these we must endeavour to excite by every possible device. The child must be talked to; his attention must be attracted by brightly coloured objects; he may be bombarded with small flannel bags filled with beans, until he holds up his hands to protect himself, and eventually assumes the offensive; he must be made to listen to and join in the romping, singing, and drilling of the class; by any means he must be made to *move*, and until this has been accomplished, systematic lessons are quite out of place.

The Co-ordination of Movement.—With the development of movement, its co-ordination must be attended to. In the healthy child this takes place naturally through the constant repetition induced by his own initiative. "Practice makes perfect." In the ament the nervous discharge is irregular, and the harmonious adaptation of the motor response to the sensory stimuli, so that an optimum result follows a minimum expenditure, is slowly and laboriously acquired.

Co-ordination is more readily developed in the case of a few large muscles, such as those concerned in standing, walking, and

pushing, than in the twenty odd small muscles of the hand or in the intricate muscular apparatus concerned in speech. Consequently, the first exercises must be directed towards teaching the child to maintain a proper balance of the body, to run and to walk, to push and pull, to seize, to hold, and to let go, tolerably large objects. For this purpose such exercises as mounting a ladder placed against a wall, walking between the rungs of a ladder placed flat upon the ground, marching in, out, and over various obstacles to the accompaniment of music, and accurately covering with the feet a series of footprints chalked upon the ground, as recommended by Séguin, are of the highest service.

At a later stage finer movements of the trunk and limbs may be attended to, and here games with a ball (such as cricket, football, and rounders), free exercises, musical drill, dumb-bells, and breathing exercises, find their place. The daily occupations of dressing and feeding, particularly the management of the spoon, afford most valuable fields of instruction. In milder cases, definite "eye-drill" may be given.

Lastly, manual dexterity must be developed by the kindergarten occupations, writing, drawing, cutting-out, paper-folding, clay-modelling, and the like. The imitation and transfer movements of Warner may here be utilized in some of the mildest cases.* Dr. Warner, in fact, regards them as "far more educative than clay-modelling, drawing, and other child occupations." Theoretically this is so, but it is possible for an educational method, as for an article of food, to be so concentrated as to be unappetizing; and these exercises have the disadvantage of being somewhat uninteresting, and of requiring an amount of attention of which the mentally defective child is often incapable. In the training of these children *interest* is everything.

The correction of irregular movements in the form of athetosis, "tricks," or "habits," is accomplished by the same methods as those used to develop co-ordination. Where the abnormality is chiefly in the hands, the kindergarten occupations, or in coarser cases the peg-board, will be found of great service. This latter is a flat rectangular board drilled with holes of varying size, into which corresponding pegs are to be fitted. Where the motor

* See an interesting paper by Dr. Warner on "The Training of the Intelligence through the Hand," read at the annual meeting of the Sloyd Association, 1902.

irregularity concerns the face or trunk, facial and bodily gymnastics are indicated.

The Training of the Intelligence.—No means exist, or ever will exist, by which we can *supply* intelligence to the mentally deficient. Each of these children has a certain capacity for development, which it is the object of training to educate, or "lead out," and which in the absence of appropriate training would remain undeveloped. To a very considerable extent this is accomplished, as already remarked, by systematic exercises stimulating the receptive and perceptive faculties, and developing, controlling, and correcting the motor response. In the present section I propose briefly to refer to some of the principles underlying more direct appeals to the intelligence, and here we shall also consider reading, writing, and speech. These methods, of course, are only applicable to the milder degrees of mental deficiency.

One of the commonest and most important defects occurring in these children concerns the faculty of *attention*. In children of the inert, placid type, spontaneous attention is often lacking, and the child remains unmoved and indifferent, whatever happens. This condition results from a diminished nervous excitability, and it is remedied by a vigorous bombardment of the sensorium through every afferent pathway. On the other hand, the restless, unduly motile, hyperexcitable type are usually characterized by a want of voluntary attention and concentration. Though seemingly so vivacious, they can settle down to nothing, and almost every conscious sensation or every thought distracts them from their task. The only way in which concentration and useful work can here be obtained is by presenting the child with something which is interesting. In fact, the keynote to attention is interest, and the psychological principles for developing the power of attention may be expressed in the following three maxims: *First*, the pupil's occupations must be those in which he has an interest naturally (and it may be remarked that the child whom *nothing* will attract is in a very parlous state); *secondly*, his interest must be enlarged by the introduction of new occupations closely allied to, and leading out of, those in which he is naturally interested; *thirdly*, an artificial or derived interest must be created for those subjects which are not attractive in themselves, or, as Ribot says, they must be "rendered attractive by artifice." Rewards of various kinds form useful attractions.

The process of *association* is of paramount importance in mental action. By its means all the varying impressions received through the senses are again connected, so as to produce a complex picture or a sequence of ideas. Defective power of association means not only crudeness of the individual mental images, but often paucity of images and ideas generally. In training this function, the method is the opposite of that employed in teaching discrimination. There sensations were presented singly, here they are presented simultaneously, the law of association being that impressions which are simultaneously received by the brain tend to acquire functional connexions. For example, let the child handle, bite, note the form and colour and learn the name of, a shilling. The subsequent auditory sensation "shilling" will call up a mental picture composed of its associates. Object-lessons are also of great value in training association.

Memory is largely dependent upon the power of association, and in proportion as we develop this so we cultivate memory. It is very useful to encourage the child's power of recall by getting him to give an account of the things seen or done upon returning from a walk or at the end of the day. Exercises in repeating poetry, quotations, and the like, help the child to remember the particular things repeated, but it is a mistake to imagine that they do anything towards cultivating the "faculty" of memory in general.

The capacity for *forming thoughts*, *judging* and *reasoning*, is best stimulated and encouraged by individual contact with that teacher who knows how to present to the deficient mind in an easily assimilable form the simple facts of nature and everyday life. What are called *object-lessons* are here of the greatest value, but their value consists, not so much in the matter, as the manner in which they are presented. A good teacher will know how to turn [illegible] anything to account, although most benefit will result fro[illegible] objects in which the child has a natural interest. It is [illegible] highest importance that he should be carefully questioned and encouraged to ask questions, and the teacher must ensure that everything is in the concrete, and that the ideas presented to the child have their visible, tangible, and material counterparts.

Speech.—The mechanism concerned in speech, and the chief anomalies present in the mentally deficient, have been described in a previous chapter. In some of these children speech is absent

in consequence of a lesion of the motor centre, and these cases are probably incurable. In others intractable deafness is the cause, and then occasionally (but very occasionally where mental defect is present), speech may be acquired by means of lip imitation. Other children of the lower grades apparently never speak because they have no ideas to express, or because it is easier for them to voice their feelings by grunts, screeches, and inarticulate noises. In the majority of the milder aments, however, there is some ability to speak, but speech is faulty and imperfect in consequence of conditions which, if not entirely curable, are at least in great part ameliorable by treatment.

There are two chief causes of these defects: Firstly, anatomical abnormalities of the end-organs concerned in speech-production or in the perception of sounds; secondly, deficient muscular action and inco-ordination. The former of these consist of adenoids, enlarged tonsils, cleft palate, suppurating otitis, etc., and are chiefly responsible for thickness, indistinctness, and alterations of tone. These must be attended to by the surgeon before systematic instruction is attempted. Muscular inco-ordination gives rise to stammering, stuttering, inability to pronounce certain consonants, and the habit of substituting easy sounds for those which are difficult. The essence of speech-training consists in discovering the nature and cause of the particular faults, and remedying them by the appropriate methods.

Where muscular action is defective, which may be but part of a general inertia as seen in the stolid type of aments, it may be cultivated by encouraging the child to make use of his lips and tongue in blowing a toy trumpet or whistle. But in cases where muscular inco-ordination is the chief fault this is unnecessary, although such children, including stutterers and stammerers, will be benefited by a course of lip and tongue gymnastics and breathing exercises. In many cases where the faculty of speech lingers music is a great help. As Dr. Shuttleworth says, "Such children will frequently hum tunes that take their fancy before they are able to articulate words; but if attractive tunes set to words containing repetitions of simple sounds (such as the 'Ba-ba, black sheep,' of our old nursery rhymes) are constantly repeated to them, the probability is that, after a time, first one word and then another will be taken up by the pupil, till the rhyme as well as the tune is known."

In cases of slurring, word-clipping, and consonantal defects, the fault generally lies in a want of synergic action, and the only remedy is for the teacher to demonstrate with his own articulatory apparatus how the defective sound should be produced, until the child is able to imitate it. This requires considerable patience of both teacher and pupil, and it is essential that the latter should carefully watch the teacher's mouth and lips the while. It is useful to remember that many consonants which cannot be pronounced at the beginning of a word can be produced in the middle, and thus the desired sound may often be forthcoming if it is preceded by one the child knows.

Writing naturally follows speech, and the first steps consist in the making of strokes upon the ruled slate. Much of the difficulty experienced by defective children is the result of imperfect co-ordination, which only practice and patience will overcome, and many of the imbeciles never do overcome it. In any case it will be necessary for the teacher to guide the child's hand in his initial attempts at making vertical, horizontal, and oblique lines, and this may have to be kept up for weeks. Some children learn to make rough drawings more easily than to write, probably because the task is more interesting, and the practice of tracing pictures which underlie a piece of framed frosted glass is sometimes of assistance to writing. The imbecile who, after repeated coaxing, is unable to make any attempt at tracing, and whose only result is a meaningless scribble, is probably incapable of being taught.

Reading.—Few imbeciles acquire the power of reading, but the majority of the feeble-minded, as a result of years of training, learn to read books of simple words and short sentences. Many of the higher types, indeed, become good readers. Probably the best method of teaching is the word method, in which short words are read " at sight " before any attempt is made to teach the alphabet; but time and patience rather than any particular method are the chief essentials.

Arithmetic.—Number is usually a great stumbling-block to aments, although there are some feeble-minded persons who have an extraordinary affection for dates, and occasionally ability to calculate. The reason of their difficulty seems to be their inability to appreciate the abstract, and it is essential, in teaching number, that concrete examples should always be made use of. This is done by means of beads, counters, the abacus, or by gradu-

ated wooden rods. The cultivation of the child's faculty of discriminating *size* and *weight* through his muscle sense, in the manner previously described, is a useful prelude to teaching him number. An excellent form of concrete instruction is afforded by the "shop lesson." Having mastered the princip' of addition and subtraction by means of actual objects, the less defective pupils may be initiated into the mystery of the numerical symbols, but progress with these will usually be very laborious.

Industrial Training.

Hitherto we have been concerned with the chief means by which the intellectual and nervous functions of the mentally deficient child may be stimulated and brought into orderly use—with *education* in its general sense. We now pass to technical instruction. It is not to be assumed, however, that the two are really separate, or that this latter has no educational value. On the contrary, technical or industrial training is not only a continuation, and the natural outcome, of many occupations and exercises which have formed part of the general training; but in itself it is of distinct educational value. It is a well-recognized fact that the mentally deficient child learns more with his hands than with his head; whilst his future is far more a matter of manual than of mental dexterity. Industrial and technical training, therefore, is at once an educational factor of considerable importance, as well as the only means of turning these unfortunate children to practical account. It has been shown that, as a result of this training, a considerable number of the milder aments become capable of remunerative work; and even where the social position is such that this is unnecessary, it is still of the greatest use in providing them with employment. The teaching of a definite occupation, then, should never be omitted, and should, if possible, be begun during childhood or adolescence. One cannot but feel that in many instances there is a tendency to allow school-training to go beyond its real purpose—that of cultivating intellectual and nervous action generally—and to make it too scholastic.

The nature of the industrial training must be determined by the particular characteristics of the individual, regard being paid, of course, to sex and social position, and to the probable environment in after-life. Where possible, an outdoor occupation should be

selected, and particularly so in the case of those whose coarsely formed hands stand in the way of any manual dexterity—such, for instance, as the Mongolians. But care must be taken to protect those so engaged against the inclemency of the weather, and it must be remembered that there may be many days when this will absolutely prevent outdoor work. Gardening, whether of flowers, fruit, or market produce, is particularly suitable, and the child's taste for this may be developed, as well as a certain amount of useful information imparted, by practical object-lessons in growing seeds, plants, etc., in the schoolroom. The strong and sturdy type may be usefully employed in the dairy or on the farm.

Where regular outdoor work is impossible, either on account of the physical condition of the patient or for lack of accommodation, there are many useful and remunerative indoor occupations which may be taught. Amongst these may be mentioned, for males, boot-making, tailoring, carpentry, basket-weaving, mat and brush making, chair-caning, bookbinding, and suchlike. For females there are cookery, laundry work, dressmaking, hand and machine sewing, knitting, and even embroidery and fine-art needlework. In all well-equipped institutions a considerable amount of the making, mending, and general domestic work of the establishment —even the printing—is performed by the inmates, under supervision. Instruction in these various occupations is, of course, given by skilled master hands.

Moral Training.

The training of the child's moral or ethical sense is by no means the least important of the teacher's duties; indeed, if this is not carefully attended to, the education of his intellect may simply result in an increased power for ill, and cause him to be, not merely useless, but actually dangerous to society. Moral education, therefore, forms an essential part of the home and school training of the mentally deficient child. It has for its general object the repression of antisocial tendencies and the inculcation of habits or principles which will enable the child to adapt his conduct to the laws of his society and the well-being of his fellow-creatures. It is entirely removed from, and, from the physician's standpoint, is of greater importance than, religious education. If the condition of the child permits, the elementary principles of a religious doctrine may be added, and in some cases Christian ideals may exert a considerable effect upon the moral behaviour. The question of

religious education, however, is the domain of the ecclesiastic, and beyond the scope of this work.

The bulk of aments are rather *a*moral than *im*moral, and their defect of ethical sense stands in the same relationship to that of the normal child as does their defect of general intelligence, requiring also special means for its development. There are, however, three types specially prone to the commission of immoral acts, and the training of these must be the object of particular care.

These are, first, those who are readily induced to commit anti-social acts, at the instigation of unscrupulous persons, because of their extremely "facile" disposition. Impressionable, susceptible, and readily swayed, utterly incapable of withstanding the suggestions, good or bad, of their companions, the only safeguard is to keep them away from temptation, and to ensure that their social atmosphere shall be good. It is possible that in course of time this atmosphere may to some extent lead to the formation of an active moral sense, and that the persistent inculcation of moral precepts may make impressions capable of influencing their conduct; but, in my opinion, this can never be relied upon, and the only safe course with regard to this class is to keep them under permanent supervision. They are simple and confiding beings, and many of them are industrious workers.

The second group consists of those persons whose nervous constitution is so unstable and explosive that the most trifling occurrence serves to produce a violent storm. In this they will commit a grave breach of discipline, an offence against law and society, or even a serious crime. The attacks in many ways resemble the motor storms of the epileptic; in fact, the condition may well be termed one of psychic epilepsy. In such cases some degree of control is frequently acquired as the result of regular occupation, careful supervision, and firm discipline. Medicinal treatment in the form of the bromides is often also a valuable adjunct, and by these means considerable improvement, or even cure, may be brought about.

The third group consists of those lacking in moral sense. In these there seems to be an absolutely ineradicable propensity to the commission of every kind of offence, and these persons will lie, steal, burn, destroy, and assault, without being influenced in the slightest by persuasion, threat, or punishment of any description. Again and again have I known the offence repeated almost whilst the words of contrition were hot upon the tongue. I believe

that this condition is practically incurable, and that the only safeguard lies in strict and permanent detention.

Passing now to the ordinary type, in which there is neither a specially facile disposition, a predisposition to emotional storms, nor deeply ingrained immoral and criminal tendencies, we have to consider the manner in which the latent ethical sense may be sufficiently developed to lead the child to shape his conduct in accordance with the manners and customs of good society. If this be not so developed, it is tolerably certain that the age of puberty, if not earlier, will see the assertion of many animal instincts which the weakened capacity of control will be powerless to overcome.

It was stated by John Stuart Mill that the foundation of the moral principle lies in *utility*. The mentally normal child may be taught to be moral through a gradual recognition of this. By being made to suffer the natural consequences of his own breaches of discipline, he is gradually brought, through his intellect, to appreciate that virtue is attended with pleasurable, and vice and wrongdoing with unpleasant, consequences. To a certain extent this may be made use of in the mentally deficient child, but his defect is often such that he cannot be made to appreciate the natural consequences, the utility or futility, of every act he commits, and this result can only be attained by a system of arbitrary rewards and punishments.

There are many rewards for good conduct which appeal to these children. In the lower types the promise of a toy, a sweetmeat, or some little treat in the shape of an entertainment, will often prove a useful incentive to good behaviour. Many mentally defective school-children attach great value to the little cardboard medal pinned upon their breast by the teacher, and at a later stage the commendation alone of the instructor to whom they have grown attached will suffice. Similarly with punishment. The deprivation of some favourite article of food, such as the withholding of pudding for dinner, the denial of the entertainment which the child's companions are allowed to enjoy, the reproof of the teacher—all these may be made use of to impress upon the child that wrongdoing is unpleasant, and that it is wisdom to be good.

It is very important that the whole demeanour of the teacher should be kind and sympathetic, gentle but firm, and that all petting and spoiling should be rigorously avoided. Approbation,

if earned, should be bestowed ungrudgingly, and will be found a powerful incentive to further progress and factor in moral training. Disapprobation, if consistently expressed, is often equally efficacious as a deterrent.

With regard to the infliction of corporal punishment opinions are somewhat divergent. My own feeling is that it should be avoided wherever possible. But in cases of wilful and flagrant breaches of discipline or open defiance of authority it is not only justifiable, but beneficial; in fact, it is often the only means by which the child may be taught that respect for others which is the essence of morality.

In the task of implanting good habits and the developing of the ethical sense, the faculty of imitation, often so marked in these children, must never be lost sight of, since it may readily be turned to good or bad account. It is extraordinary how mild and gentle girls, brought up in an atmosphere of refinement and care, will suddenly, and upon the slightest provocation, give vent to a torrent of the most disgusting and obscene abuse which they may have heard by chance on some solitary occasion. It is of the highest importance that the surroundings and the tone of mentally deficient persons should be well ordered from the very beginning, and there is no doubt that the home environment of early life exercises a most potent influence in after-years. We cannot expect these children to become affectionate, sympathetic, and generous unless these qualities are evident in the lives of those about them, and a rigorous censorship of the entire social atmosphere, even with regard to pictures and entertainments, is an absolute necessity. If we are to ensure truthfulness, honesty, and uprightness, it is essential that parents, teachers, and physician should be truthful, just, and straightforward in all their dealings with these children. Reward and punishment must be deliberate, and apportioned in such a manner as not only to fit the crime, but to establish its relationship in the mind of the child. Otherwise it will result in more harm than good, and will inevitably lead to a complete alienation of confidence and affection. By the judicious imposition of punishment or reward, which the child recognizes as being related to his fault or virtue, we shall be in no danger of losing his love and affection or violating his sense of justice. We shall develop, rather than perplex, his reasoning power, and we shall cultivate his moral sense and control just as we developed his intellectual capacity.

CHAPTER XX

THE LAW OF ENGLAND CONCERNING AMENTIA

PRIOR to the year 1913 the laws of England regarding the care and control of persons suffering from amentia were far from satisfactory. Idiots and imbeciles, it is true, were provided for by two statutes—namely, the Idiots Act of 1886, and the Lunacy Act of 1890. The education of mentally defective children was also sanctioned by the Defective and Epileptic Children Act of 1899; but the largest and most important class of all—that of the adult feeble-minded—was not recognized, and the absence of any legalized provision for their systematic care and control caused no little hardship to the defectives themselves, besides being a source of very considerable danger to the welfare of the community. It was, in fact, to a great extent the recognition of this which led to the appointment of the Royal Commission of 1904, "to consider and report upon the existing methods of dealing with idiots and epileptics, and with imbecile, feeble-minded, or defective persons not certified under the lunacy laws."

It is extremely gratifying to find that the labours of this Commission have now resulted in an Act of Parliament, and in the Mental Deficiency Act of 1913 we have a consolidated measure which contains provisions for the adequate supervision of a considerable proportion of the mentally defective population. I say a considerable proportion, because it is necessary to point out that the provisions of the Act do not extend to mental defect as such, but only to those aments who fulfil certain conditions. Since the Mental Deficiency Act contains clauses defining the duties of education authorities in regard to this class, also clauses regulating transfers from lunatic asylums to institutions for defectives, and *vice versâ*, and since it repeals the Idiots Act, it has become the chief measure concerning aments, and it is therefore necessary to give a short summary of its main provisions:

THE MENTAL DEFICIENCY ACT, 1913.* [3 & 4 Geo. V.]

An Act to make Further and Better Provision for the Care of Feeble-minded and other Mentally Defective Persons, and to amend the Lunacy Acts.

(To come into operation on April 1, 1914, and not extending to Scotland or Ireland.)

Defectives within the Meaning of the Act.

The classes of persons who are defectives within the meaning of this Act are four—namely, *Idiots*, *Imbeciles*, *Feeble-minded Persons*, and *Moral Imbeciles*. [Clause 1.]

The legal definition of each of these has already been given on pp. 91-94.

Circumstances rendering Defectives subject to be dealt with.

A person who is a defective may be dealt with under this Act by being sent to, or placed in, an institution for defectives, or placed under guardianship—

(A) At the instance of his parent or guardian, if he is an idiot or imbecile, or at the instance of his parent if he is a feeble-minded person or moral imbecile and is under the age of twenty-one; or

(B) If in addition to being a defective he is a person—

(i.) Who is found neglected, abandoned, or without visible means of support, or cruelly treated; or

(ii.) Who is found guilty of any criminal offence, or who is ordered, or found liable to be ordered, to be sent to a certified industrial school; or

(iii.) Who is undergoing imprisonment (except imprisonment under civil process), or penal servitude, or is undergoing detention in a place of detention by order of a court, or in a reformatory or industrial school, or in an inebriate reformatory, or who is detained in an institution for lunatics or a criminal lunatic asylum; or

(iv.) Who is an habitual drunkard within the meaning of the Inebriates Acts, 1879 to 1900; or

(v.) In whose case such notice has been given by the local education authority as hereinafter mentioned; or

* Printed by Eyre and Spottiswoode, Ltd., and to be purchased from Wyman and Sons, Ltd., Fetter Lane, London, E.C.

(vi.) Who is in receipt of poor relief at the time of giving birth to an illegitimate child or when pregnant of such child. [Cl. 2 (1).]

Methods of Procedure.

The methods of procedure in the case of the above persons are as follows:

A. By Parent or Guardian.—If the patient is *an idiot or imbecile*, the parent or guardian may place him in an institution or under guardianship upon certificates in the prescribed form signed by two duly qualified medical practitioners, one of whom must be a medical practitioner approved for the purpose by the local authority or the Board of Control. [Cl. 3.]

If he is *not an idiot or imbecile, and is under the age of twenty-one*, his parent may place him in an institution or under guardianship; but in that case the two medical certificates must be supplemented by the certificate of a judicial authority—*i.e.*, a County Court Judge, a Stipendiary Magistrate, or a specially appointed Justice—signed after such inquiry as he shall think fit, and by a statement of particulars signed by the parent or guardian. [Cl. 3 (1).]

A defective coming within any of the categories (i.) to (vi.) enumerated above may be dealt with as follows:

B. By Petition to a Judicial Authority from any Relative or Friend, or from an Authorized Officer of the Local Authority.—Such petition must be accompanied by *two medical certificates*, one of which must be signed by a medical practitioner approved for the purpose by the local authority or Board, or a certificate that a medical examination was impracticable, and by a *statutory declaration* signed by the petitioner and by at least one other person (who may be one of the medical signatories) stating—(*a*) that the patient is a defective within the meaning of the Act, and the class of defectives to which he is alleged to belong; (*b*) that he is subject to be dealt with under the Act, and the circumstances which render him so subject; (*c*) whether or not a petition under this Act or under the Lunacy Act has previously been presented concerning the patient, and if such has been presented, the date thereof and the result of the proceedings thereon; and (*d*) if the petition is accompanied by a certificate that a medical examination was impracticable, the circumstances which rendered it impracticable. [Cl. 5 (1), (2).]

If the petition is not presented by a relative or by an officer of

the local authority, it must contain a statement of the reasons why it is not so presented, and of the connexion of the petitioner with the person to whom the petition relates, and the circumstances under which he presents it. [Cl. 5 (3).]

Upon the presentation of the petition and the aforesaid documents the judicial authority shall either visit the alleged defective person or summon him to appear before him. [Cl. 6 (1).]

Any proceedings before the judicial authority may be conducted in private at his discretion, and shall be so conducted upon the desire of the alleged defective. [Cl. 6 (2).]

If the judicial authority is satisfied that the person is a defective, and subject to be dealt with under the Act, he may then, if he thinks it desirable to do so, make an order for his detention in an institution the managers of which are willing to receive him, or he may appoint a suitable person to be his guardian. Provided that where the petition is not presented by the parent or guardian, no order shall be made without the consent in writing of such parent or guardian, unless the judicial authority is satisfied that such consent is unreasonably withheld, or that the parent or guardian cannot be found. If the judicial authority is not satisfied that the alleged defective comes within the Act, or that it is desirable in the interests of the patient that an order should be made, he may adjourn the case for a period not exceeding fourteen days for further information, he may order that the patient shall submit himself to medical examination, or he may dismiss the petition. Unless the petition is dismissed, the judicial authority must order a medical examination in any case where the petition was accompanied by a certificate that a medical examination was impracticable. [Cl. 3 (3) (4).]

C. By Order of the Court.—On the conviction by a court of competent jurisdiction of any person of any criminal offence punishable with penal servitude or imprisonment, or on a child brought before a court under Section 58 of the Children Act, 1908, being found liable to be sent to an industrial school, the court, if satisfied on medical evidence that he is a defective within the meaning of this Act, may either postpone passing sentence or making an order for committal to an industrial school, and—(1) direct that a petition be presented to a judicial authority, or (2) may make an order similar to, and which shall have the same effect as, that made by a judicial authority. [Cl. 8 (1).]

D. By Order of the Home Secretary.—Where the Secretary of State is satisfied from the certificate of two duly qualified medical practitioners that any person who is undergoing imprisonment (except imprisonment under civil process) or penal servitude, or is undergoing detention in a place of detention by order of a court, or in a reformatory or industrial school or in an inebriate reformatory, or who is detained in a criminal lunatic asylum, is a defective, the Secretary of State may order that he be transferred therefrom and sent to an institution for defectives, the managers of which are willing to receive him, or that he be placed under guardianship, and any order so made shall have the like effect as if it had been made by a judicial authority on petition under this Act. [Cl. 9.]

Effect and Duration of Orders.

The effect and duration of orders made as above is as follows:

(1) *If the order is for the defective to be sent to an institution*, it authorizes his conveyance thereto and his reception therein at any time within fourteen days after the date of the order. [Cl. 10 (1).]

The order expires at the end of one year, but may be continued for a year, and afterwards for successive periods of five years, if the Board of Control, after due consideration, are of opinion that such is desirable in the interests of the defective person, and make an order for the purpose. [Cl. 11 (1), (2).]

Where a defective has been placed by his parent or guardian in an institution or under guardianship, the parent or guardian may withdraw him at any time on giving notice in writing to the Board of Control, unless the Board, after considering what means of care and supervision would be available if he were discharged, determine within fourteen days that his own interest requires his further detention, and in that case no further notice by the parent or guardian shall be allowed till after the expiration of six months from the previous notice. [Cl. 12 (1).]

The managers of any certified institution, or house, or any approved house, may discharge any defective placed there by his parent or guardian on giving one month's notice to the Board and to the parent or guardian of the defective, if known. [Cl. 12 (3).]

(2) *If the order is for the defective person to be placed under guardianship*, it confers on the person named as guardian such powers as would have been exercisable had he been the father and the defective been under the age of fourteen. The guardian also has the

power of warning persons against supplying intoxicants to or for the use of the defective. [Cl. 10 (2).]

The term "intoxicants" includes any intoxicating liquor, and any sedative, narcotic, or stimulant drug or preparation. [Cl. 71.]

Varieties of Establishments.

The varieties of establishments in which a defective person may be detained are as follows:

A. State Institutions.—These are established, maintained, and managed by the Board of Control for defectives of criminal, dangerous, or violent propensities. [Cl. 35.]

B. Certified Institutions are those for which a certificate has been granted by the Board upon being satisfied of their fitness for the control and care of defectives. Such institutions may be established and maintained—

(1) By the local authority. [Cl. 38 (1).]

(2) By the poor-law guardians upon application of the local authority. (They are then called approved premises, but are on the same footing as certified institutions.) [Cl. 37 (1).]

(3) By other persons. [Cl. 36.]

C. Certified Houses are houses certified as fit by the Board in which defectives are received for private profit. They may receive and detain defectives under the order of a judicial authority in the same way as may certified institutions; but no part of the cost of maintaining defectives in certified houses can be paid out of money provided by Parliament or by the local authority. [Cl. 49.]

D. Approved Homes are premises approved by the Board—(1) in which defectives are received and supported wholly or partly by voluntary contributions, or by applying the excess of payments of some patients for or towards the support of other patients; and (2) houses in which defectives are received for private profit.

It is illegal to receive or detain in an approved home any person ordered to be detained by a judicial authority, a court, or a Secretary of State. [Cl. 50.]

Authorities, their Powers and Duties.

A. The Board of Control is the central authority, and consists of fifteen Commissioners appointed by His Majesty, and a chairman. It is charged with the general superintendence of matters relating to the supervision, protection, and control of defectives [Cl. 21], including the supervision of the administration by local authorities

of their powers and duties under the Act ; the certification, inspection, and visitation of institutions, houses, and homes; the visitation of defectives; the provision and management of State institutions. [Cl. 25, 35, 36.]

B. The Local Authority is the Council of the county or county borough [Cl. 27] acting through a statutory "Committee for the Care of the Mentally Defective," which may include co-opted members, and to which all matters relating to mental defectives, under the Act (except that of raising a rate or borrowing money, and matters of urgency) shall stand referred. [Cl. 28.]

The duties of the local authority are—

(1) To ascertain what persons within their area are defectives subject to be dealt with under the Act under any of the headings (i.) to (vi.) enumerated on p. 425.

(2) To provide suitable *supervision* for such persons, or if this does not afford sufficient protection, to take steps for sending them to *institutions* or placing them under *guardianship*.

(3) To provide suitable and sufficient accommodation for such persons as are sent to certified institutions by orders under the Act. [Cl. 30.], etc., etc.

C. The Local Education Authority is charged with the duty—

(1) Of ascertaining what children within their area are defective children within the meaning of this Act.

(2) Of ascertaining which of such children are incapable by reason of mental defect of receiving benefit or further benefit from instruction in special schools or classes. [Cl. 31.]

(3) Of notifying to the local authority the names and addresses of defective children over the age of seven—(*a*) who have been ascertained to be incapable by reason of mental defect of receiving benefit or further benefit in special schools or classes, or who cannot be instructed in a special school or class without detriment to the interests of the other children, or as respects whom the Board of Education certify that there are special circumstances which render it desirable that they should be dealt with under this Act by way of supervision or guardianship; (*b*) who on or before attaining the age of sixteen are about to be withdrawn or discharged from a special school or class, and in whose case the local education authority are of opinion that it would be to their benefit that they should be sent to an institution or placed under guardianship. [Cl. 2 (2).]

D. A Board of Guardians may, on the application of the local authority, with the consent of the Local Government Board, and subject to the approval of the Board of Control, enter into agreement with the local authority to receive and detain defectives (under orders) in buildings provided and managed by the Board of Guardians. [Cl. 37.]

Offences, etc.

It is illegal for a person without the consent of the Board to undertake the care and control of more than one defective person elsewhere than in an institution, a certified house, or an approved home. [Cl. 51 (1).]

Any person undertaking the single care of a defective as above is required within forty-eight hours of his reception to give notice in the prescribed form to the local authority and to the Board. [Cl. 51 (2).]

But this does not apply to any defective persons who may be received and detained in accordance with the provisions of the Lunacy Acts or the Defective and Epileptic Children Act. [Cl. 51 (4).]

It is illegal to supply a defective with "intoxicants" after receiving a warning not to do so by his guardian. [Cl. 52.]

It is illegal to obstruct a Commissioner, Inspector, Visitor, or authorized officer under the Act in the exercise of his duties. [Cl. 54.]

It is illegal to carnally know or attempt so to know any defective female under care in an institution, certified house, or approved home, or while out on licence therefrom, or under guardianship under the Act; or to procure or attempt to procure any defective female to have unlawful carnal connection, whether within or without the King's dominions, with any person; or to cause or encourage the prostitution of any defective female. [Cl. 56.]

If a patient escapes from an institution, he may be apprehended without warrant by any constable or by the managers of the institution, or any person authorized by them in writing, and brought back to the institution. [Cl. 42.]

The maintenance in an institution or under guardianship of any person for whose maintenance any other person is responsible shall not deprive that other person of any franchise, right, or privilege, or subject him to any disability. [Cl. 70.]

The Idiots Act, 1886, is repealed. [Cl. 67.]

CHAPTER XXI

SOCIOLOGY

HITHERTO we have been chiefly concerned with aments as individuals; in this final chapter it is proposed to deal with them as members of the community, and briefly to consider the subject of mental defect from its sociological aspect. Until recent years no reliable and at the same time extensive statistics have existed regarding the ament as a citizen; but the extremely valuable facts brought to light by the English Royal Commission on the Feeble-minded of 1904, together with the Reports of "After-Care" Committees; of various training institutions; of such bodies as that of the National Association for the Feeble-minded; as well as data collected by independent inquirers, now throw a lurid glare upon the subject, and enable us for the first time to consider the sociological bearing of amentia in an adequate manner.

Number.

The number and distribution of mentally defective persons in England and Wales has already been mentioned in Chapter II. (p. 15), and it was there shown that on January 1, 1906, the total number of this class was 138,529, equivalent to 4·03 per 1,000 of the whole population, or 1 defective person to every 248 normal. Of this total by far the greatest proportion (104,779) were of the mildest or feeble-minded grade of defect, the remainder being idiots and imbeciles. It may be mentioned that in addition to these there were on the same date approximately 125,827 persons who were insane (certified and uncertified), so that the total number of individuals suffering from pronounced disease of mind may be put down at 264,356, equivalent to 1 person in every 130 normal, and there can be no doubt that this rate is increasing. Data are not available from which we can calculate the proportion of aments

with regard to their social status, but I think it may be accepted that there is no very marked difference in this respect.

Employment.

It will generally be conceded that one of the most important matters affecting the status of a community is that of the working capacity of its citizens. If a section exists which, by reason of inefficiency in this respect, has to be maintained by the remainder of society, the economic value of that society must be impaired. If this non-productive section is at all considerable, the burden may be so great as not only to impede the advance of the whole community, but to bring it to the verge of bankruptcy. We have seen that the ratio of the mentally deficient is no small one; the first question to consider, therefore is that of their productive utility. The idiots and imbeciles may be at once eliminated, for their economic value is practically nil. The feeble-minded, however, who comprise by far the greater proportion, are capable of useful work under suitable supervision—they have, indeed, been defined as being able to earn their living under favourable circumstances—so that the question is: "To what extent do the circumstances now obtaining admit of this?"

Important information on this point was tendered to the Royal Commission by the superintendents of several training establishments.* Dr. Caldecott, the Medical Superintendent of Earlswood Asylum, sent out a circular to the parents of patients discharged during the past fifteen years, and to this 341 answers were received, which showed that 11 were at work for wages; 13 at home, very useful; 26 at home, useful; 40 at home, no use. The remainder had either died, gone away with no address, or had been removed to other institutions. It is to be remarked, however, that of this total number the majority were idiots or imbeciles; actually only one-fifth were of the mild grade of defect, so that the proportion of these at work for wages or very useful at home may be put down as close on 30 per cent.

At the Royal Albert Asylum, Lancaster, information was received of 51 patients who had been discharged much improved. Of these, 16 were earning wages, 5 were useful in workhouses, 17 were

* Report of Royal Commission on the Feeble-minded, 1908, vol. viii., pp. 158 and 159.

useful at home, 6 were either not useful or nothing was said of them, 4 were in lunatic asylums, and 3 were dead. Dr. Douglas, the Resident Medical Officer, said: "One thing I frequently observe is that boys who have learned a trade do not continue it, but generally turn to common forms of labour. . . . They need judicious supervision, and an ordinary master or foreman will not be troubled with them while the labour of perfectly sane workmen can be had cheaply."

The report of Mr. Locke, from Starcross Training Institute, is: "I think that during the last ten years about forty children have been placed out in the world. I have information from about twenty of them. Several of these are earning their own living independently, but they were brilliant exceptions. . . ."

We may next turn to the reports of "After-Care" Committees regarding feeble-minded pupils of the special schools. In *London*, the proportion of pupils known to be in "good or promising" employment was 37·5 per cent. Two years previously it had been 45·7 per cent., and Sir George Newman, the Chief Medical Officer to the Board of Education,* attributes the falling off to two causes —*firstly*, insufficient after-care; and, *secondly*, the two additional years. He remarks: "The longer the test the more severe it is." In *Birmingham*, the "After-Care" Committee compiled information regarding 932 cases which had passed through the schools during the previous ten years. Of these, excluding the normal and dead, 272, or 34 per cent., were engaged in remunerative work. At *Liverpool*, of 712 children passing through the hands of the "After-Care" Committee during a period of six years, 85, or 11·9 per cent., were doing remunerative work.

Finally, we may refer to some figures concerning "after-care" work compiled by Sir William Chance from the returns of the National Association for the Feeble-minded.† These were based upon an inquiry made of sixteen centres of the Association, and referred to a total of 3,283 persons. Of this number, 798 were doing remunerative work, 89 were "doing work, but not reported"; 202 were useful at home; and 941 were returned as "useless members of society." If we exclude 340 who were transferred to

* Report of the Chief Medical Officer of the Board of Education, 1911 [Cd. 6530].

† Report of Annual Conference on After-Care, National Association for the Feeble-minded, 1911.

normal schools (not being feeble-minded), we have 27 per cent. engaged in remunerative work.

With regard to the term "remunerative work," however, it is to be remarked that this does not mean that the person employed is being paid the standard wage. On the contrary, it is my experience that this is practically never the case, and this is corroborated by the observations of the secretary of the Birmingham centre, who says: "Although some of our cases have been at work for more than ten years, only 34 of the whole number (173) earn as much as 10s. 2d. per week. Of these, only 6 earn as much as 15s., and only 2 earn 20s., which is the highest wage earned. . . . While it is not very difficult for some of our higher-grade cases to get work when they first leave school, it is almost impossible for them to retain their situations as they get older, and the difference between them and their fellows becomes accentuated. Uncontrolled, and often quite improperly cared for, they rapidly deteriorate, the good results obtained by the discipline and training of a special school being under these circumstances distinctly evanescent. . . . There are very few workers over twenty years of age."

There is no doubt that the training which these feeble-minded children have received (and all the statistics quoted above refer to persons who have had the advantage of special training) varies very considerably. In some instances, particularly the special institutions, it is excellent; in other instances it is not so suitable; but the failure seems to lie not so much in the methods of training as in the fact that the mentally defective person is fundamentally incapable of managing himself and the affairs entrusted to him without some degree of supervision, and it is quite clear that this supervision our present social organization does not supply.

Pauperism.

In view of the preceding figures, it cannot be wondered at that a very large proportion of the feeble-minded should sooner or later go to swell the ranks of the unemployed, who have to be maintained by the poor-law authorities, and we may now give some particulars on this aspect of the question.

In the eleven representative areas of England and Wales which were selected by the Royal Commission for personal investigation,

there were found a total of 8,813 aments. The location of these has already been shown in Table V., p. 18, and from that it will be seen that no less than 40·5 per cent. of the whole were being maintained in such institutions as workhouses, training, rescue, and inebriate homes and penitentiaries, asylums and prisons, or were receiving outdoor parish relief. This total of 8,813, however, embraces children in public elementary schools as well as idiots and imbeciles, and if we omit these classes, and confine ourselves entirely to the adult feeble-minded, we find no less than 67·8 per cent. are either inmates of institutions (for the most part under the poor law) or in receipt of outdoor relief; 52 per cent. of the total imbeciles and 54 per cent. of the total idiots are similarly maintained, partially or entirely, at the public expense; and there can be no doubt that this will happen in regard to a very considerable number of the mentally defective children now in special schools.

The proportion of aments who, to all intents and purposes, may be looked upon as paupers, is thus seen to be a large one; but this is only what would be expected in view of their mental disabilities, often combined with antisocial propensities, which we have already described. It will be of interest to consider the degrees of amentia seriatim.

Feeble-minded.—With regard to the adult feeble-minded, it is a striking fact that nearly two-fifths of the total number discovered were found within poor-law institutions. From careful inquiry into the history of those in the Somersetshire area, I found that they fell into the following groups, and the same is probably true of the country generally:

(*a*) Those born in the House, nearly always illegitimate.

(*b*) Those admitted in consequence of inability to earn their living. Most of these are below middle age; they include vagrants and street loafers brought in by the police, and a small section of "ins-and-outs" driven in by stress of weather.

(*c*) Those admitted in consequence of the death of parents or relations who have hitherto looked after them.

(*d*) Women admitted into the maternity wards.

The economic disadvantage of such a large proportion of these persons being resident in workhouses is obvious when it is stated that the majority are not in the declining years of life, but are young adults, and that comparatively few of them are remuneratively employed.

The inquiries show that more than half are below forty-five years of age, whilst from one-fourth to one-third are below thirty. It was the general experience of the investigators that more were admitted between the ages of twenty and thirty years than during any other decade. This tendency for the feeble-minded to drift into the workhouse quite early in life is even more pronounced in the large towns, and Dr. Melland found that in Manchester less than one-quarter of the total number were over fifty years of age, "in marked contrast to the normal-minded able-bodied inmates, the vast proportion of whom are above that age."

With regard to the employment of these persons, Dr. W. A. Potts, speaking of Birmingham, says: "A certain amount of employment is found for adult male defectives, who are taught boot-making, mat-making, and rope-making. Such work might be extended in this and similar institutions with advantage. It is an important proof of what can be done in workhouses." Possibly the same obtains in a few other poor-law establishments, but of the great majority throughout the country it must be said that there is very little attempt to employ these persons to any economic advantage, and I believe that the conditions which I found to exist in Somersetshire are very general. There I found that about half the male feeble-minded were more or less (generally less) usefully engaged in coal-carrying, wood-chopping, and the ordinary domestic work of the institution, whilst about two-thirds of the females were doing a little scrubbing, mending, and laundry work. The remainder were idle, and simply loafed about, many of them being either incorrigibly lazy or requiring so much supervision that they were more bother than they were worth.

In fact, the presence of such a large proportion of feeble-minded persons in workhouses is not due to any definite administrative attempt to provide for this class, or even to the suitability of these institutions. It is solely and simply a result of the inevitable tendency for the non-supervised ament to drift out of life's stream into the nearest backwater. I calculate that about 18 per cent. of the workhouse inmates of this country are feeble-minded. It will be obvious that the cost to the State of these persons must be very considerable. A short time ago a feeble-minded woman died in a workhouse in Sussex at the age of eighty-nine years. She had been under the care of the Guardians since she was four days old,

and the Clerk to the Board stated that she had cost the ratepayers roughly £1,600.

Similarly with regard to those in receipt of outdoor relief: most of them are young adults, and although a percentage are doing work which contributes to their support, there is no doubt that under a proper system they might be employed to much greater advantage. Less than one-fourth of those in Manchester were usefully employed; in the country districts, however, where work of a character more suited to the capacity of these persons is available, from one-half to two-thirds manage to earn a little. The weekly allowance which these defectives receive from the parish varies very greatly in the different unions; on the average it is probably about two shillings or half a crown, and with this and the shilling or so they earn, supplemented by an occasional gift of boots or cast-off clothes, they manage to exist tolerably well as long as they have someone to provide them with shelter, and generally take care of them. When their protectors die, the refuge of all these persons will be the workhouse.

The fact that 10 per cent. of feeble-minded persons are resident in lunatic asylums is an indication of the mental instability, as well as deficiency, of this class. For the incarceration of practically all of them is due to insanity or epilepsy.

It is apparent from these inquiries, that not only do a larger proportion of town than country defectives receive poor-law relief, but that both absolutely and relatively far more are relieved in the House. It is to be remembered that these remarks relate to the feeble-minded degree of defect only, a class which is defined as being "capable of earning a living under favourable circumstances." The facts are sufficient evidence as to how little favourable the actual circumstances at present are, and it may be remarked that not a few of these feeble-minded paupers have been educated at great cost in special schools. How illogical is the system which spends thousands upon the training of mentally defective children, and then turns them adrift to shift for themselves as best they can!

I have already remarked that competition is much more adverse to the feeble-minded in the towns than in the country, and that in consequence a larger proportion of them gravitate into institutions. This is well shown by the following table which I have compiled from the Royal Commission Reports:

TABLE XVI.

SHOWING THE LOCATION OF FEEBLE-MINDED IN URBAN AND RURAL AREAS RESPECTIVELY.

	In Institutions (Paupers).	*In Receipt of Outdoor Relief.*	*Not at Present receiving Relief.*	
			Relief will probably be required upon Death of Friends.	Friends capable of making Permanent Provision.*
Urban and industrial areas	Per Cent. 76·2	Per Cent. 3·7	Per Cent. 19·2	Per Cent. 1·7
	79·0			
Rural areas.. ..	25·7	20·7	39·8	13·6
	46·4			

Idiots and Imbeciles.—Of the idiots and imbeciles about 54 per cent. are paupers, of whom about two-thirds are in institutions, and one-third in receipt of outdoor relief. Of those in institutions, nearly two-thirds are in idiot or lunatic asylums, and the remainder in workhouses. There is no doubt, however, that a considerable number of the imbeciles at present attending elementary schools (where they learn nothing, and are often a considerable annoyance and distraction to teachers and scholars alike) will eventually become a charge upon the rates, whilst a large proportion of those not at present in receipt of relief will need provision upon the death of their parents.

With regard to the granting of relief to idiots and imbeciles, it is interesting to notice the difference of method between town and country districts respectively. The proportion actually relieved in the two situations is pretty much the same; but whereas in the towns 36 per cent. are in the workhouse and 7 per cent. outside, in the country there are but 14 per cent. in the House, as against 32 per cent. receiving outdoor relief.

* Owing to difficulty of investigation, this class is probably understated.

Vagrancy.

We may now consider the question of vagrancy. Many feeble-minded persons, with a home to which they can turn, have such a propensity for wandering that they will roam the country for miles round, and sometimes be away for days together. These are often well known to all the country-side, and they frequently get a plate of food and a shakedown in the barn of some hospitable farmer; failing that, they spend the night in a dry ditch. I do not think they usually have any definite objective; they simply ramble on where the fit takes them. I remember once pursuing one of these youths, whom I particularly wanted to find, for a whole day. I got scent of him from time to time, but, although I was driving and he was on foot, it was nightfall before I overtook him, and he must have walked at least twenty miles. Neyroz* describes the case of one of these persons, confined in an Italian asylum, who repeatedly escaped in order to visit neighbouring cities and write an account of his experiences on his return. His wanderings were very extensive, and his written accounts very circumstantial; but investigations showed that, although he had undoubtedly been to the places he described, his descriptions were largely imaginative. In this case the route was carefully marked out beforehand by means of atlases and geography books, but his limited mental capacity prevented him making any real use of the itinerary he had compiled.

On the other hand, a small number have no permanent home, but simply shift for themselves as best they may, and these, perhaps, are more properly called vagrants. As a rule they are the least defective members of the feeble-minded, and although the bulk of them drift into the workhouse sooner or later, they do for a time, particularly in the country, manage to exist by their wits. How this is accomplished can generally only be conjectured; many of them seem to be itinerant vendors of something or other, and no doubt they often get a free meal or cast-off suit of clothes given to them, failing which they are not averse to begging. Some years ago I used constantly to meet a feeble-minded couple of this description—man and wife—who roamed the country collecting rags, bones, rabbit-skins, and suchlike. But my inquiries showed that their defect gave them an unfair advantage over their normal-

* N. Neyroz, abstract in *Journal of Mental Science*, July, 1905, p. 618.

witted competitors, inasmuch as compassion gained for them what money had to procure for the others, and this is probably the case with most of the feeble-minded living by their wits. A few of these persons manage to earn enough to pay for bed and breakfast in a common lodging-house; these, however, are the élite, and the majority either sleep "rough" or get a bed in the casual ward. The inquiries of the Royal Commission show that on the whole about 10 per cent. of the feeble-minded come within the category of vagrants, whilst about 10 per cent. of all vagrants are feeble-minded. For the most part I think they are well-behaved and inoffensive, but some have decided insane or criminal tendencies, and such are an undoubted menace to society.

Aments under Inadequate Care.

By no means one of the least important of the facts ascertained by the Royal Commission was that of the number of aments, in the eleven areas examined, whose care and control was inadequate, and for whom further provision is needed, either (1) in the interests of the patients themselves, or (2) for the public safety. The former group consists of persons who, in the opinion of the respective investigators, are unsuitably or unkindly cared for; the latter, of aments possessing habits and propensities which render them a source of danger to the community in which they live. It was recognized that many persons might be living under conditions which were not ideal, but these were not included, the object being to ascertain the irreducible minimum in urgent need of provision at the present time. I propose to quote these figures as affording statistical proof of the extremely unsatisfactory relationship at present existing between the ament and society.

In column 2 of the following table is shown the percentage of persons suffering from each of the three degrees of defect who were found to be inadequately cared for in the areas examined. There is no reason for thinking that these results are other than typical of the entire country; column 3 therefore shows the estimated total number of these persons in England and Wales:*

* This estimate does not include feeble-minded ("mentally deficient") children, who, according to the Report of the Royal Commission, number 35,662, or 0·59 per cent. of the children on the school register; nor does it include sane epileptics. If these two classes are included, the total number of persons urgently in need of provision, according to the Report of the Royal Commission, is 66,509.

TABLE XVII.

AMENTS INADEQUATELY CARED FOR.

Degree of Defect.	*Percentage inadequately cared for to Total Number in Eleven Areas investigated by Royal Commission.*	*Estimated Total Number inadequately cared for in England and Wales.*
Idiots	40·8 per cent.	2,381
Imbeciles	46·2 ,,	7,689
Feeble-minded persons	31·8 ,,	15,793

It will be of interest to note the chief locations of these persons needing further provision. In the case of the *feeble-minded*, the highest proportion of those unsatisfactorily provided for occurs in the classes at large and in charitable institutions, in which situations between 40 and 50 per cent. require further care. With regard to those at large this high proportion is not surprising, but a word of explanation is necessary in reference to the charitable homes. The high proportion here is not any reflection upon these homes, but is simply due to the fact that their provision is temporary and optional only, and that most of the inmates are feeble-minded girls who have given birth to children. It is obvious that in the case of such persons detention should be permanent and compulsory. About one-fifth of the feeble-minded in workhouses, and one-fourth of those in receipt of outdoor relief, are reported to be unsatisfactorily provided for.

Of the *idiots* and *imbeciles*, the greatest proportion in need of provision occurs amongst those receiving outdoor relief. In two-thirds of these the present conditions are so unsatisfactory as to urgently call for amendment, and nearly all of these are in rural districts. Of those at large in fairly well-to-do circumstances, one-quarter require further care or control; whilst of those at large who are the offspring of the labouring class, the present provision is unsatisfactory in one-half. There can be no doubt that the presence of these persons in small and often overcrowded cottages is fraught with considerable possibilities of harm. But even apart from actual danger, want of time and want of knowledge on the part of the parents must prevent the imbecile or idiot receiving the atten-

tion he needs, and which he would obtain in an institution; whilst his presence cannot be regarded as conducive to the comfort of the home. As far as the idiots and imbeciles themselves are concerned, the accommodation provided by the workhouses is tolerably satisfactory; it is rarely, however, that any special wards exist for them, and it must be admitted that the other inmates often view the question in a somewhat different light. Indeed, from remarks which have been frequently made to me, I am disposed to think that no little of the reluctance evinced by the poor classes to avail themselves of the House, and even of the workhouse infirmary, is due to the presence therein of the mentally defective.

Crime.

The question of mental defect and crime was considered in Chapter XV., and it was there shown that approximately 10 per cent. of aments evinced a marked propensity towards the commission of criminal offences, equivalent to a total of about 13,000 such persons in England and Wales. Conversely, about 20 per cent. of the total number of prisoners are mentally deficient.

It is important to realize that the lapses of these persons are not isolated events in their life-history. On the contrary, the average number of convictions per person is considerable, and I have met with many aments who have served scores, some even hundreds, of sentences. In giving evidence on this point before the Royal Commission, Dr. Smalley said: "Against 130 out of 333 weak-minded prisoners who were unfit for ordinary penal discipline by reason of mental deficiency, no previous conviction had been recorded; but for this absence of record their nomadic habits might in part account. Against fifty-six 1 conviction had been recorded, against twenty-eight 2; the remainder varied from 4 to 105 convictions. About half had been convicted from 5 to 10 times. . . . The bulk of them become habitual criminals. Their tendency to recidivism is strongly marked, and it would seem, from a consideration of individual cases, to be almost an invariable rule for persons of this type who have once manifested criminal inclinations to become prison habitués, and to steadily deteriorate morally and intellectually under the present régime." Dr. Hamblin Smith,* Medical Officer of Stafford Prison, as the

* M. Hamblin Smith, "Notes on 100 Mentally Defective Prisoners," *Journal of Mental Science*, April, 1913, p. 326.

result of a special inquiry into 100 mentally defective prisoners, found that the 100 had a combined record of 1,104 convictions, or an average of 11 per prisoner, and this number was regarded as being below the actual truth. Ten of the prisoners had over 30 previous convictions. Dr. W. R. Dawson* found that in the two prisons in Dublin 12·21 per cent. of the inmates were defectives. The average number of previous convictions for the male defectives was 17·76, and fifteen of them had over 50 convictions each. The average number of previous convictions for the females was 44·13. Many of them ran into hundreds, and one was in prison for the two hundred and thirty-sixth time, and she was only twenty-nine years old. There is, indeed, no occasion to labour this point any further, for it is the experience of all who have had any practical dealings with this class that, as Dr. Smalley said, "the tendency to recidivism is strongly marked."

In most instances the offences committed by these persons are of a minor character; at the same time, the number of serious offences amounts to no inconsiderable total. Their nature, in order of frequency, is as follows: Drunkenness, vagrancy, begging, larceny and housebreaking, prostitution, neglect of children, indecent assaults, common assaults, arson, suicide, and homicide. The returns of 111 weak-minded convicts at Parkhurst reveal, amongst others, 13 instances of attempting to murder, 10 of carnal knowledge of girls under thirteen years of age, 9 of murder, 5 of manslaughter, and 3 of rape.

Inebriety.

We may now briefly refer to the question of inebriety. The relationship existing between alcoholism and mental defect is of two kinds. As pointed out in dealing with causation, I hold the view that excessive and long-continued indulgence in alcohol may so impair the germ plasm as to produce mental defect in the offspring. On the other hand, there is no doubt that the "craving for drink" is very often only a symptom of some degree of mental impairment already present. Its effects, moreover, are much more potent in the case of the neuropathic and psychopathic than in that of the normal population. Since the passing of the Inebriates Act of 1898, and the consequent temporary detention of a certain proportion of chronic inebriates in reformatories, it has become possible

* W. R. Dawson, *Journal of Mental Science*, July, 1910, p. 466.

to ascertain certain data regarding this class which were previously unobtainable, and these are so striking as to be worth quoting.

A return* of 1,873 persons admitted to reformatories, where they are kept under conditions which afford perfect opportunity for close observation, shows that 48 were insane, and subsequently certified and sent to asylums; 271 were very defective (imbeciles, degenerates, epileptics); 857 were defective in less degree (eccentric, silly, dull, senile, or subject to periodical paroxysms of ungovernable temper); and 697 were of average mental capacity (on admission or after six months' detention). In the category of defective and very defective there are, therefore, 1,128 persons, or 60 per cent. of the whole; and "nearly all these gave evidence of possessing some of the peculiarities in cranial conformation, general physique, and conduct, which have long been recognized as evidence of congenital defect."

Dr. Branthwaite, Inspector under the Inebriates Acts, says that two-thirds of the persons committed to reformatories were irreformable, and that the main factor determining their irreformability was their mental condition. "Very many of the cases sent to us from the courts under this Act are none other than just feeble-minded persons, drunkards simply because they are feeble-minded. . . . The removal of liquor from some of these persons, even for long periods, does not greatly improve their mental state, and this is especially so in the congenitally defective who are the progeny of feeble-minded, lunatic, epileptic, or drunken parents."

The Superintendent of Brentry Reformatory says that of 70 per cent. of cases he "cannot conceive the possibility of their ever acquiring sufficient self-control to be able to keep them from drunkenness and support themselves." Dr. Gill, of the Langho Reformatory, estimates that 50 per cent. of inmates are mentally defective. Dr. Winder, of the State Inebriate Reformatory at Aylesbury, says that out of 167 patients received since 1901, "25 per cent. are definitely and undoubtedly feeble-minded high-grade imbeciles. . . . If, however, the term 'feeble-minded' is to be extended over a broader basis, and made to include all those individuals who are abnormally excitable, subject to attacks of uncontrollable temper, perverted morally, inconsequent in ideas, of

* Report of the Royal Commission on the Feeble-minded, 1908, vol. viii., p. 137. See also the Report of Dr. Branthwaite, Inspector under the Inebriates Acts, 1909, Cd. 5799.

feeble reasoning powers, and unable to acquire knowledge beyond the most rudimentary principles, then nearly all might be classed as feeble-minded, but certainly over 70 per cent. should be so defined. They are so mentally unstable as to be incapable of earning their livelihood on equal terms with their normal fellows."

Propagation.

The next sociological consideration to which I desire to draw attention is that of the rate of propagation of aments. I think it has long been recognized by psychiatrists that the birth-rate in psychopathic families tends to be high, but it is only since the birth-rate of the general community has fallen (that of the mentally abnormal remaining at its previous high level) that the matter has assumed a serious aspect, and has begun to attract attention. Some inquiries which I made on this subject in 1900 showed that, whilst the average number of births to a marriage in England and Wales was 4·63, the average number in markedly psychopathic families was 7·3. At the time, these figures were either unnoticed or received with some scepticism; but their accuracy has since been amply demonstrated by other independent inquiries, and there can be no doubt that the disproportion obtaining between the birth-rate of the " fit " and the " unfit " has now become a problem of most serious significance to the nation.

Dr. Ettie Sayer* made an inquiry into this and other points regarding mentally defective children attending the special schools in London. The inquiry lasted two years (1904-1906), and in order to avoid selection the name of every seventh child in the school registers was taken, and the family history followed up, the same process being adopted in a normal school. It was found that in 100 normal families there was a total of 506 children and 23 miscarriages, 387 of the children being still alive. On the other hand, in the families from which the 100 mentally defective children came there was a total of 761 children born, 101 miscarriages, and 467 children living.

Miss Mary Dendy, the founder of the Sandlebridge Colony, Cheshire, a lady whose interest in, and knowledge of, the mentally deficient are well known throughout the country, tells me that she has investigated the family history of a large number of these

* Ettie Sayer, *Eugenics Review*, July, 1913, p. 162.

persons, and has no doubt whatever that the birth-rate amongst them is considerably higher than among the normal population.

Similar results are forthcoming from America.* Dr. Johnstone found that feeble-minded women were nearly twice as prolific as normal females; whilst Dr. Kiernan's investigations of ninety degenerate families disclosed the average number of children to be eleven; also that multiple births occurred ten times more frequently than in the general population.

The evidence is clear, then, that the birth-rate in psychopathic families is now very considerably in excess of that in the non-psychopathic. The question naturally arises: "What is the condition of the offspring as a whole? Are they on the average up to the normal standard, or do they show some social inferiority?" As throwing some light on this subject, I may refer to some particulars ascertained during the course of my investigations in Somersetshire. Of 61 feeble-minded women whom I found had given birth to children, 19 were married and 42 unmarried. The 19 married have hitherto produced a total of 80 children. Of these, 16 died in infancy, 19 are imbecile or feeble-minded, 20 are either physically delicate to a pronounced degree or are mentally dull and backward, whilst 8 are too young to satisfactorily examine. There are only 17 out of the total 80 who appear to come up to the average standard of mental and bodily health. With regard to the illegitimate children, the particulars are of necessity less complete. The 42 mothers have so far produced 78 children. Of these, 24 died in infancy, 5 are imbecile or feeble-minded, 2 are markedly dull and backward, 2 appear to be normal, and the remaining 45 have been completely lost sight of. It must be remembered that in practically all these cases information as to the *paternal* inheritance of these children is unobtainable.

To these particulars I may add some details regarding the brothers and sisters of 150 aments whose family history I investigated in 1900. I divided these into two classes, which were designated "satisfactory" and "unsatisfactory." The *satisfactory* group comprised all those who were said to be healthy in mind and body, and were able to support themselves. The *unsatisfactory* consisted, in addition to those prematurely dead, of those who were either mentally affected, or were suffering from marked and permanent ill-health, or were leading a life of vagabondage or crime, Such

* Quoted by Dr. H. Work, *American Journal of Insanity*, July, 1912.

details were, of course, difficult to get, and as the valuation was generally that of the parents, the figures are almost certainly more favourable to the class than is really the case. These figures are shown in the following table:

TABLE XVIII.

SHOWING THE CONDITION OF 150 AMENTS WITH THEIR BROTHERS AND SISTERS.

(*In the* 150 *families there were* 1,269 *children born.*)

Unsatisfactory.			*Satisfactory.*	
(*a*) Born dead		170	Said by parents to be mentally and bodily healthy	456
(*b*) Since died:				
Under 1 year ..	138			
„ 3 years ..	107			
„ 10 „ ..	37	315		
„ 20 „ ..	8			
Over 20 „ ..	25			
(*c*) Mentally affected ..		245		
(*d*) Diseased, paupers, or criminals		83		
Total		813	Total	456
			1,269	

Some points in this table are worthy of note. *Firstly*, the large number of children born. According to the Fortieth Annual Report of the Registrar-General, the average number of births to a marriage in England and Wales in 1876 was 4·63. The number of children in 150 normal families would therefore be 694; whereas in the families we are now considering the number born alive is 1,099, or an average of 7·3 per family. *Secondly*, the large number of stillbirths. No precise data exist with regard to the number of these in the normal population, as they are unregistered, but Farr and Newsholme estimate them at about 4 per cent. of the total births. If these families were normal, we should therefore expect to have 44 children stillborn, whereas we find 170. *Thirdly*, the mortality of these children is even more remarkable. According

to the life-table of the Registrar-General, based upon the years 1881-1890 (Supplement to Fifty-Fifth Annual Report, 1895)—

Had the 1,099 Children belonged to the "Average" Class, there would have been surviving—		*Whereas there were surviving—*
At end of 1 year	937	961
" " 3 years	864	854
" " 10 "	823	817
" " 20 "	800	809

In other words, the mortality is practically identical with the normal.

I do not wish to press the point unduly, because the number dealt with is but small; but I think, in view of the steady decline in the birth-rate of the general population which has taken place since 1878, there can be no doubt that the offspring of the psychopathic are not merely holding their own in proportion to the entire population, but are undergoing a steady increase. And, even assuming that the 456 brothers and sisters of these aments are really sound in body and mind, as stated by their parents (which, however, I greatly doubt), it is to be remembered that they come of a pronounced morbid stock, and are not only capable of, but exceedingly likely to transmit the taint to a subsequent generation.

It is to be remarked that these are families in which as a rule the psychopathic condition is evident in one of the parents only. I have obtained particulars of many families in which *both* parents have borne the taint, and in such cases I have never yet seen normal offspring.

On this point we may refer to some valuable researches which have recently been made in America under the auspices of the Eugenics Record Office. The history of the "Hill Folk"* well illustrates how the social status of a whole district may be determined by the multiplication of an undesirable stock. In the neighbourhood of a small town lying among the New England hills there is a population among which feeble-mindedness, alcoholism, and immorality are rife. It was found that practically all the less desirable inhabitants could be traced back to one of two original sources—a shiftless basket-maker, probably of French origin, and an Englishman, both of whom migrated into the district about the year 1800. Their descendants comprise the "Hill Folk" described

* Florence H. Danielson and Charles B. Davenport, "The Hill Folk," Bulletin of Eugenics Record Office, August, 1912.

in this memoir, and it was found that between 1879 and 1889 they absorbed almost one-tenth of the whole amount spent by this town in poor-law relief. This proportion has now risen to more than one-fourth, and during the past thirty years sixteen of these descendants have been sentenced for serious offences, mostly of a sexual character, their punishment costing the State about 10,000 dollars. The pedigree charts which accompany this interesting record show the extensive prevalence of feeble-mindedness among this stock.

Another genealogical study made under the same auspices relates to the descendants of Joseph "Nam,"* who lived in the mountains of Massachusetts about 1760. The original Nam had eight children, some of the descendants of whom were prosperous, but the majority sank into the lowest social grade, and are now living under the most wretched conditions. Of 784 descendants who have been traced, it was found that 88 per cent. of females and 90 per cent. of males were excessively addicted to alcohol; 180 were illegitimate; there were 232 licentious women and 199 licentious men, as contrasted with 155 chaste women and 83 chaste men; there were 19 epileptics, 24 insane, of whom 7 have been in custodial care, 3 in a girls' home, 15 in an orphan asylum, and 40 in State prisons.

The history of the "Jukes," already mentioned, and that of the Kallikak family,† may also be referred to in this connexion. The latter has recently been traced and fully described in detail by Dr. Goddard, and his study is well worth perusal, as showing the hereditary nature and sociological bearings of feeble-mindedness. A certain Martin Kallikak married in 1837. Both he and his wife were normal, and their descendants for six generations, numbering several hundreds of individuals, were traced by Dr. Goddard, and were also normal. But Martin Kallikak had an illegitimate child by a girl who was feeble-minded, and the descendants along this line in about the same number of generations who were living under the same environment in the same State yielded no less than 222 feeble-minded offspring out of forty-one matings.

* A. H. Eastabrook and C. B. Davenport, "The Nam Family," August, 1912.

† H. H. Goddard, "The Kallikak Family," 1912.

Illegitimacy.

This subject is intimately related to that of the propagation of aments. What proportion of aments are illegitimate and what proportion of mentally deficient persons produce illegitimate children, I do not know, but certainly the number must be very considerable, as will be apparent from some statistics.

As a result of inquiries made in the years 1902-1904 of the Magdalen Homes in England, to which 100 homes sent replies, it was found " that 14,725 inmates had passed through the homes in that period, and that of these 2,521, or about 16 per cent., were returned as feeble-minded. Of this number, 588, or 25 per cent., had one illegitimate child, and 198, or 8 per cent., were known to have had more than one, making a total of 786, or 33 per cent., mothers of illegitimate children among the feeble-minded inmates."* But there is every reason to think that these figures are below the actual number, owing to the absence of direct medical evidence regarding the mental condition of the inmates; and Dr. Potts says that of 100 consecutive cases admitted into the Magdalen Home at Birmingham, 26 were feeble-minded, 7 were cases of moral insanity, 1 was epileptic, 1 was lunatic, and 1 was deaf and dumb. I have had the opportunity of examining practically every case admitted to one of these homes during the past five or six years, and I have a knowledge of the inmates of several others, and I should put the proportion of mental defectives among them at quite 40 per cent. of the total inmates. Returns obtained by the Preventive Committee of the National Vigilance Society, as a result of special inquiries of 203 Boards of Guardians, show that, during the year 1889, 715 weak-minded women passed through 105 workhouses, whilst at 56 workhouses it was stated that the approximate number of such women who were leading immoral lives was 366.

The following particulars were ascertained by the medical investigators appointed by the Royal Commission. They relate entirely to feeble-minded females, and chiefly to inmates of workhouse maternity wards:

In *Manchester*, Dr. Melland found that, out of 94 women in these wards, 19 were feeble-minded, all the children except two being illegitimate. On making further inquiries of some of the younger

* Report of Royal Commission on Feeble-minded, vol. viii., p. 175.

of the other 167 feeble-minded women in the house, it was ascertained that another 13 admitted having given birth to illegitimate children, and Dr. Melland states that these inquiries were only of a partial and incomplete nature.

In *Birmingham*, Dr. Potts found that 4 out of the 34 women in the maternity wards were mentally defective, whilst at *Stoke-on-Trent* the same observer found that, of the 17 women giving birth to children during the period of inquiry, 7 were feeble-minded, all the children being illegitimate. Dr. Potts ascertained that the total progeny resulting from 16 mentally defective women was no less than 116. In the lock wards he found 5 feeble-minded women, all of whom were prostitutes.

In the rural districts the state of affairs was even worse. In *Wiltshire*, Dr. Pearse found that, of 58 feeble-minded women in the workhouse, 18 had given birth to illegitimate children. In *Nottinghamshire*, Dr. Gill ascertained that 11 out of 23 of these women had borne illegitimate children. In *Carnarvon*, Dr. Perry found that half the inmates of the maternity wards were mentally defective, nearly all the children being illegitimate; whilst in *Somersetshire* I ascertained that fully half of the women admitted into the workhouse to be confined during the previous five years had been feeble-minded; further, that out of *all* the feeble-minded women in the area (167), nearly two-fifths (61) had given birth to children, two-thirds of whom were illegitimate.

It should be remarked that in few cases is the propagation by these women limited to a single child. More often the offspring number three or four, and one feeble-minded woman whom I saw had given birth to six illegitimate children. All of these were by different fathers, and she was confined of each one in the workhouse. I may add that I discovered one feeble-minded woman in a workhouse who had given birth to seven illegitimate children, although *she had never left the precincts of the house.*

When it is remembered that these figures only relate to a relatively small portion of the country, that the investigations only extended over a period of a few months, it is clear that the number of children reproduced every year throughout England and Wales by feeble-minded women must be very great. In some cases the mothers have pronounced erotic tendencies, and many of them seem to be entirely lacking in any sense of shame, modesty, or even ordinary decency, but even the best-behaved, and those

of good parentage brought up amid every refinement, are often so facile that it is utterly unsafe for them to be at large without protection.

As bearing upon the questions of propagation and the social conditions of the amen[illegible] may cite the following cases which have come within my own experience:

Upon the edge of a moor in a thinly inhabited part of the West Country, stands a filthy thatched wooden hovel consisting of two rooms. Its exterior has an air of utter desolation and [illegible] interior is in a state of indescribable dirt and confusion. It is occupied by a married couple and their family. The man, aged fifty years, is of a decidedly low animal type, and has considerable moral, as well as slight mental, defect. He never refuses a drink, and picks up a living by occasional osier-stripping, and doing odd jobs on farms, but chiefly by poaching. The woman, his wife, is forty-four years old and feeble-minded. She seems to be busy most of the day in her way keeps the house going; but she is utterly lacking in any capacity for management, and the filth and disorder are extreme. This woman had three children before marriage, and nine since. Of the former three, one died young of consumption, a second has entirely disappeared, and the third lives about the neighbourhood; but he quarrelled with his mother's husband, and they are not now on speaking terms. Of the nine born in wedlock, two died in infancy, three attend the village school and are mentally defective, and another also mentally defective is at home. The eldest does odd jobs with his father, and seems to be able to take care of himself. The remaining two are aged five months and three years respectively, and are too young to enable an opinion to be formed as to their mental capacity. To this it may be added that the father has had ten children by a previous wife. Of these, two are feeble-minded, one of whom is living a life of prostitution, and has already had two illegitimate children in the workhouse. The others have been entirely lost sight of.

Mary H—— is a feeble-minded married woman forty years old. She lives with her husband, a farm labourer, in a small cottage in an isolated village. She is industrious and always working, but the house is in a disgraceful muddle. At my visit there were two unwashed, partially dressed children, under three years of age, sprawling about the wet stone floor amid a litter of dirty plates

and pans, potato peelings, and live poultry. Upon asking her how old she was, and how long she had been married, she replied, with a fatuous smile, that she didn't know, but her mother did. The children I saw in the house were too young to examine mentally; but two other illegitimate children whom I did see, aged sixteen and seventeen years respectively, were feeble-minded. Both of these are industrious boys, and work well under supervision, but they are quite incapable of looking after their affairs. This woman has two brothers, who are also feeble-minded; one is constantly in and out of the workhouse, but the other, aged thirty, is employed regularly with a farmer at the rate of a shilling a day. Their mother has had several attacks of insanity, but the father is dead, and no particulars were obtainable regarding him.

Rose D—— is a feeble-minded woman forty-five years of age. She is the daughter of a well-to-do farmer, but ran away from home at the age of twenty years, and since then she has been living a life of prostitution. Her usual abode is the common lodging-house, but a considerable part of her life has been spent in prison, the workhouse, and various charitable homes. She has been confined of three illegitimate children in the workhouse. The clergyman of the parish in which she lives says that he has got her into homes again and again, but she will not stay, and they cannot compel her to do so. All attempts to induce her to lead a respectable life have failed, and she is his despair and "a disgrace to the civilization which permits her to be at large."

I may add that these are by no means isolated instances. I have known cases in which feeble-minded girls have been actually exploited by their own mothers for immoral purposes, and many of the particulars regarding this matter which have come under my own notice are too revolting for publication, and show in the clearest manner that the propagation by aments is both a terrible and extensive evil.

REMEDIAL MEASURES.

I think it will be apparent from the foregoing remarks that the condition of mental deficiency is one which is attended with most important and far-reaching social consequences. Indeed, the economic disability, the antisocial propensities, and the rate of propagation of these persons, combine to constitute a problem of

a magnitude that no civilized country can afford to neglect, either in the interests of the defectives themselves, or in those of the general community. I do not propose to enter into any detailed discussion as to the solution of this problem, but there are a few points to which it will not be out of place to refer.

And first of all we may dismiss the suggestion of a "lethal chamber." I do not say that society, in self-defence, would be unjustified in adopting such a method of ridding itself of its anti-social constituents. There is much to be said both for and against the proposal, but it is so clearly impracticable in the present state of public opinion that it need not be considered. We have to recognize that mental defectives exist, and must be allowed to exist, and the questions before us are as to the way in which the State can best deal with them, and the manner in which it can prevent their procreation.

Training.—We have seen that, in spite of the great expense of time and money spent upon the training of defectives, their economic value remains exceedingly small; and this, together with the fact that the defect can never be cured, that these persons can never really become self-dependent, raises the question as to whether such training is justifiable. In spite of the results hitherto obtained, I believe it is. I fully recognize that we must avoid the danger of this training becoming a fashionable fad, and being carried to an extent out of all proportion to the results likely to be achieved—that, in fact, not only must the ament be sheltered from the neglect or adverse competition of society, but that society and the rate-payer must be protected against the ament. I believe, however, that both these ends are best attained by suitable training, and that the withholding of such is not only injurious to the individual ament, but constitutes a danger to the State, besides being an economic blunder.

Supervision.—The fault of our present method lies not so much in the training as in the absence or inadequacy of suitable after-care. We have been content to spend large sums of money upon the education of these persons—I am now speaking of the mildest grade—to place them in situations, and then to assume that they were quite capable of shifting for themselves; and it is to the neglect to provide adequate supervision during adolescence and later life that we must attribute much of the evil which has been described in the preceding pages.

The fact is, that although training will certainly do much to repress the growth of vicious, criminal, and insane tendencies, and will render the mildest grades of defect capable of remunerative employment, or even of earning a living, this can only be so "under favourable circumstances." Competition with the normal population is impossible, and, as a result of the Workmen's Compensation and Employers' Liability Acts, employment is becoming more and more difficult to obtain for these persons. Not only must work suited to their capacity be found for them, but in the great majority of cases the wages so earned must be laid out, and a general supervision exercised over their whole behaviour, just as in the case of children. Provided this be done, the time and money spent on training will be well repaid, and will result in the transformation of useless, and even dangerous, individuals into useful, happy, and contented members of society. Failing this supervision, however, aments, whether trained or otherwise, will certainly degenerate, and will inevitably swell the population of our asylums, prisons, and workhouses. In the case of females, it is tolerably certain that even before this can happen the blight will have been passed on to a new generation.

It would be beyond the purpose of this work to enter into any discussion as to the precise nature of this supervision, and undoubtedly this must vary with, and be dependent upon, the habits, propensities, capacity, and character of each individual. Any method of administration which does not take these into account, and which attempts to provide for mental defect in the abstract, cannot be an economic success. Briefly, we may say that to be satisfactory the provision for each individual must be of such a nature as to (1) adequately safeguard the interests of society against the special peculiarities of the ament; (2) protect the ament against the evil suggestions and pernicious influence of certain sections of society, and at the same time ensure him kindly treatment; (3) utilize his working capacity to the fullest and most remunerative extent, so that the cost of provision falls as lightly as possible upon an already overburdened ratepayer. In general, these three conditions will best be fulfilled by compulsory detention in suitable colonies or institutions; but for some cases guardianship or oversight without detention, as proposed by the Royal Commission, will be adequate. The provisions of the Mental Deficiency Act of 1913 should undoubtedly do much to minimize the evils which

have resulted from the neglect to afford adequate supervision in the past, and they mark a distinct step in the right direction.

The Prevention of Propagation.

The next important question is that of procreation. We have seen that aments are being produced at a rate which can only be described as alarming. This is due in part to the propagation by persons who are themselves mentally deficient, in part to the relatively increased fertility of persons who, whilst not actually aments, are of pronounced psychopathic inheritance. The result . . to bring about an increasing ratio of the mentally, physically, and socially unfit, which, if unchecked, must not only handicap social progress, but which may hurl the State into the abyss of degeneracy.* For it is to be borne in mind that the psychopathic do not mate only amongst themselves. They intermarry with the hitherto untainted and normal members of the community, and in so doing constantly drag fresh blood into the vortex of disease. To check this evil, three methods have been proposed, to which we may briefly refer. They are—(1) *Asexualization;* (2) *compulsory segregation during the reproductive age;* and (3) *the regulation of marriage.*

Asexualization.—As formerly practised, this consisted in the operations of castration and ovariotomy; but these have now been superseded by those of vasectomy and salpingectomy. The operation of vasectomy is quite simple, and the experience of some hundreds of cases shows that there is no atrophy of the testicles, no secondary mental or other changes, and no unfavourable symptoms. The operation in the female is naturally somewhat more serious, but even this can now be performed without risk, and it appears quite conclusive that the effect in both male and female is merely to produce sterility without loss of desire or any other untoward results. In America† these operations have now been performed upon many hundreds of cases, both male and female, and it is contended that by their means, in addition to being rendered sterile, many aments have been cured of depraved and bestial propensities,

* On this subject, see an article by the author on "Eugenics" in the *Quarterly Review*, July, 1912.

† For an account of some recent American legislation regarding sterilization, see "Proposed Sterilization of Certain Degenerates," by Dr. R. R. Rentoul, *The Therapist*, September 15, 1910; also a very interesting article by Dr. S. A. Bontor dealing with marriage and sterilization in the *Medical Press*, August 18, 1909.

and their general behaviour much improved. I do not doubt that there are persons, not necessarily aments, upon whom the performance of this operation is not only justifiable, but advisable;* but the enforced sterilization of all psychopathics is quite out of the question, and the only aspect of the matter we need consider is that of the wholesale adoption of these operations as a means of preventing propagation by aments. My own opinion is that, whilst being of service in particular cases, it must be a work of supererogation in the majority. It seems to be forgotten that, although it will prevent these persons propagating, it will not make a mental defective competent, a pauper independent, an inebriate sober, or a criminal moral. In the great majority of aments supervision and segregation will still be called for on account of personal traits, and it is futile to think that these persons can be turned loose upon society merely because they have been sterilized. In any event, present public opinion in England is so far from being ripe for any such proposal that it may be regarded as outside the field of practical politics.

Segregation.—Where the effective supervision of aments cannot be secured by other methods, then it seems to me that their segregation in suitable colonies affords the best practical means at our disposal for at once securing the kindly care of the mentally deficient, their useful and profitable employment, and the restriction of their propagation. In the original draft of the Mental Deficiency Bill there was a clause empowering the detention of those "in whose case it is desirable that they should be deprived of the opportunity of procreating children." This, of course, would have had to be accompanied by efficient safeguards, but such would not be difficult to devise, and it can only be regarded as unfortunate for the nation that an outburst of hysterical sentiment should have caused the clause to be abandoned. It is the experience of all who have had to do with aments that they are not only safer and more useful, but also much happier, in a suitable institution affording the companionship of their compeers.

Regulation of Marriage.—By this is meant the prohibition by law of the marriage of those persons who are likely to produce degenerate offspring. Such persons fall into two classes—

* For some remarks as to cases in which sterilization is advisable, see a paper by the author, "Some Medical Aspects of Eugenics," *Medical Press*, July 31 and August 7, 1912.

(1) Those who are in themselves mentally defective or otherwise abnormal; and (2) those who, whilst not being defective, come of a pronounced psychopathic stock. With regard to actual aments, it is, in my opinion, utterly illogical and absurd to permit a class to enter into a marriage contract the mildest members of which are defined by Act of Parliament as suffering from a degree of defect "so pronounced that they require care, supervision, and control for their own protection or for the protection of others." It may be that legal prohibition would only partially check their propagation, because, as we have seen, a considerable number of their offspring are illegitimate; but that considerable benefit to the State would result cannot be doubted, and in view of the incomplete protection afforded to the ament and to society by the Act of 1913 I regard it as deplorable that the clause in the original draft of this Bill was omitted. This clause made it a misdemeanour for any person to intermarry with, or attempt to intermarry with, or to solemnize or procure or connive at the marriage of, a defective within the meaning of the Act.

The case of those persons who are not aments, but who suffer, or have suffered, from insanity, epilepsy, or other disorder of mind, stands on a somewhat different footing; but even here I see no reason why their marriage in certain instances should not be forbidden by law. If the prohibition did not avail entirely to check their propagation, it would do something in this direction, and it would certainly be a great factor in the education of public opinion regarding the responsibility of marriage. Were this responsibility more fully realized, and greater care taken in inquiring into the health and antecedents of the contracting parties, we should hear very much less about the need for reform in the law of divorce. Laws of this kind already exist in some European countries and in several of the States of America, and although it is difficult to obtain definite information as to their working, and opinions differ somewhat regarding their value, there seems to be little doubt that on the whole they have been productive of good, and have not only helped to educate the conscience of the community, but have prevented many undesirable persons from getting married.*

* For the most recent and complete account of American marriage regulations, laws concerning sterilization, the prohibition of the entrance of immigrants, together with an extensive bibliography of the whole subject, see "Die Rassenhygiene in den Vereinigten Staaten von Nordamerika," by G. von Hoffman, Austrian Vice-Consul in California. Munich, 1913.

Lastly, we may briefly consider the much larger and more far-reaching question of the prohibition of the marriage of those persons who may not in themselves evince serious mental abnormality, but who yet come of a pronounced psychopathic stock, and who may transmit the germinal impairment to their descendants. The genealogical inquiries which have been made in recent years amply demonstrate the existence of a class in whom, although the taint is latent, it is nevertheless present, and transmissible to subsequent generations. It is clearly within the province of social science to consider whether the laws of heredity may not be utilized in the formulation of such regulations regarding marriage as would not only check the propagation of these germinally tainted, but would encourage that of the germinally healthy, and so secure the biological advance of the race. That the biological fitness of its citizens must be a matter of prime concern to any community cannot be questioned. In former days it was secured by the operation of natural selection, but this has been to a very great extent thwarted and neutralized by progress in the art of medicine and by the development of a sentiment which tends to consider the individual before the race, with the result that the problem of the unfit is now assuming serious proportions in all civilized communities.

For my own part, I am convinced that the nation which wishes to escape degeneracy will sooner or later have to give serious attention to the matter of the innate constitution of its citizens, and the manner in which that innate condition may be controlled by laws concerning marriage. Nevertheless, I do not think that any legislation on these lines is possible at present, for two reasons: Firstly, because the laws regarding hereditary transmission are not sufficiently known; and, secondly, because we have no data regarding the antecedents of the mass of the people.

With regard to the first of these, the defect is rapidly being remedied, and the researches which are now being carried out in both hemispheres leave little room for doubt that reliable knowledge will soon be forthcoming concerning the rules governing hereditary transmission. With regard to the second desideratum, progress is much less marked, and although it is perfectly true that many of the more enlightened members of the country are now paying attention to their genealogical tree from the biological aspect, there is a complete absence of records in the case of the

great bulk of the community. It was this defect which caused me some time ago to advocate the establishment of a system of national family records,* which I think must be an essential prelude to any useful legislation regarding marriage.

But although the facts at present available are not sufficient to justify legislation, there are many cases in which the experienced physician is quite able to give a reliable opinion as to whether the offspring of a particular union is likely to be healthy or the reverse. It is true that the advice given is not always followed, but the fact that it is sought, and in my experience increasingly sought, is evidence of the development of a conscience on the subject, and I hold that it is certainly the duty of the medical profession to be prepared to give advice in the matter.

But the medical profession has a still higher duty. It is to our profession that the State looks for advice and help regarding the *future* health of the State, and I consider it to be at once our privilege and responsibility to speak on this subject of the propagation of the germinally unfit in clear and unmistakable terms, and so help to form this public conscience.

So long as we are content to raise no voice against the marriage of the diseased, the degenerate, the habitual criminal, and the chronic pauper, and are willing to educate, feed, clothe, and ultimately pension as many offspring as these persons see fit to produce; so long as legislation is permitted a free hand in doing everything calculated to diminish parental and social responsibility and to strike at the very root of any incentive to labour; so long as our law-makers and would-be philanthropists are blind to the folly of transferring the burdens and penalties inevitably following carelessness, improvidence, indifference, drunkenness, and unlimited selfishness from the shoulders of those upon whom they should rightly fall to the careful, provident, and industrious members of the State—then so long will these classes (and these qualities) continue to be perpetuated, and their numerical ascendancy is simply a question of time.

It cannot be other than gratifying to those who have the welfare of their country at heart to find that public regard is at length being focussed upon this question. Many years ago the observations of Francis Galton led him to see the possibilities for good or

* A. F. Tredgold, "Marriage Regulation and National Family Records," *Eugenics Review*, April, 1912.

ill which might be exerted by social science acting in the way I have indicated. To him must be attributed the modern enunciation of the science of eugenics, which he defined as " the study of agencies under social control that may improve or impair the racial qualities of future generations either physically or mentally "; and it is in the study and application of these principles that we shall find the antidote to degeneracy and the true road to racial progress.

Finally, we have to look beyond measures designed to check the perpetuation of an existing taint, and to consider how it may be prevented at its source; how we may obviate that initial germinal impairment in which lies the prime origin of defect, and much of the disease, of mind. The causes of germinal variation, whether retrogressive or progressive, are very imperfectly known, and there is urgent need of their study. My own observations have led me to the conclusion that they are to be found in the environment, using this term in its widest sense, and that the psychopathic diathesis which reaches its culmination in amentia is, at the beginning, dependent upon disease or disorder of metabolism induced by external causes and faulty modes of life. It is probable that many of these adverse influences pass unrecognized, and that they vary with different social conditions; but the chief of them to-day would appear to be chronic alcoholism, tuberculosis, syphilis, and the hurry and scurry, with all their attendant stress, excess, and dissipation, of modern life. The evolution of society has outstripped the evolution of the race, with the result that a disharmony has been produced which now reveals itself in various manifestations of germinal impairment.

According, therefore, as we diligently seek out and conform to the laws of health, and as we improve the manner of living, the moral, mental, and physical fibre, and the general well-being of our people, so shall we be successful in preventing disease of mind, and it is to those entrusted with its present and future welfare that the nation must look to enforce these principles by wise legislative enactments.

APPENDIX

NOMENCLATURE

THE multiplicity of terms which are applied to the genus and the different grades of mental defect is a source of no little confusion, and hence it is hoped that the accompanying Table of Synonyms may not only help to make the nomenclature of this condition somewhat clearer, but may be of service to those desiring to consult foreign literature. It is necessary to point out, however, that many foreign terms are used so loosely, and often in such a contradictory fashion, that it is frequently no easy matter to assign their precise English equivalents; but so far as I can ascertain from my own reading, their meaning is as shown in the table, and this is in general accord with the views of Dr. Shuttleworth, Dr. R. Langdon Down, and Dr. G. A. Auden, who have most kindly given me the benefit of their experience on this matter.

It will be seen that with regard to the conditions of idiocy, imbecility, and moral imbecility, the terms are practically identical, all of them being derivatives of *idios* and *imbecillus* respectively. At the same time it is to be remarked that these words are not always used in this precise sense (as indicative of a definite grade of amentia), but are still sometimes applied to aments in general, or even to various stages of dementia. Thus, I have even heard English asylum medical officers speak of the mental weakness resulting from insanity as "imbecility" and "idiocy." It need hardly be said that such use of these terms is to be deprecated as liable to lead to no little misunderstanding.

With regard to the general condition, the usual English generic word is *mental deficiency* (or, in medical and scientific works, *amentia*), although the whole class are not infrequently included under the term the *feeble-minded* (*e.g.*, The Royal Commission on the *Feeble-minded*). Since, however, this latter term is really a more specific one, it seems better that it should be restricted to the mildest grade of aments, and this, as a matter of fact, is the more

	GERMAN.	TERMS SUGGESTED.
1. Generic term, ...ending all ... arrested or ... mental deve... from birth, or ... early age. (Fo... tion, see p. 8.)	...WACHSINN ...WACHSINNIGKEIT ...DSINN (Secundärer Blödsinn = De...entia) ...STESSCHWÄCHE	AMENTIA
	...WACHSINNIGE ...DSINNIGE	AMENTS
2. Low-grade (... Amentia. (Fo... tion, see p. 94.	...OTISMUS ...OTIE	IDIOCY
	...OTEN	IDIOTS
3. Medium-grade ... (For definitio... p. 93.)	...EZILLITÄT	IMBECILITY
	...EZILLE	IMBECILES
4. High-grade (... Amentia. (Fo... tion, see p. 91.	...LBSCHWACHSINNIGKEIT ...CHWACHBEFÄHIGKEIT	MOROSIS
	...CHWACHBEFÄHIGTE ...STIGMINDERWERTIGE ...CHTSCHWACHSINNIGE ...ILE	MORONS
5. The lowest gr... mental deve... among the ... (i.e., non-defe... population.	...CHWACHBEFÄHIGKEIT ...WERFÄLLIGKEIT	SIMPLICITAS *vel* STUPIDITAS *vel* FATUITAS
	...STIGZURÜCKGEBLIEBENE ...WACHBEGABTE ...WERFÄLLIGE ...CHWACHBEFÄHIGTE	SIMPLES *vel* STUPIDS *vel* FATUOUS
6. Amentia associa... persistent crim... immoral condu... definition, see	...TLICHE MINDERWERTIGKEIT ...RALISCHE IMBEZILLITÄT ...RALISCHER SCHWACHSINN	AMORÂLIA
	...RALISCHE SCHWACHSINNIGE ...RALISCHE IMBEZI...LE	AMORALES

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		ENGLISH.	AMERICAN.	
1. **Generic term, comprehending all grades of arrested or imperfect mental development from birth, or from an early age.** (For definition, see p. 8.)	Condition	AMENTIA MENTAL DEFICIENCY	FEEBLE-MINDEDNESS MENTAL DEFICIENCY IDIOCY (occasionally)	A I
	Persons	AMENTS MENTAL DEFECTIVES FEEBLE-MINDED (occasionally used, but now more often applied to Class 4)	FEEBLE-MINDED MENTAL DEFECTIVES	A A
2. **Low-grade (severest) Amentia.** (For definition, see p. 94.)	Condition	IDIOCY	IDIOCY	I
	Persons	IDIOTS	IDIOTS	I
3. **Medium-grade Amentia.** (For definition, see p. 93.)	Condition	IMBECILITY	IMBECILITY	I
	Persons	IMBECILES	IMBECILES	I
4. **High-grade (mildest) Amentia.** (For definition, see p. 91.)	Condition	FEEBLE-MINDEDNESS MOROSIS	(?) MOROSIS FEEBLE-MINDEDNESS (occasionally)	F
	Persons	FEEBLE-MINDED MORONS The feeble-minded under the age of sixteen years are known as MENTALLY DEFECTIVE CHILDREN	MORONS The terms MENTALLY FEEBLE and FEEBLE-MINDED have now been almost superseded by the term **Morons**	D F
5. **The lowest grade of mental development among the normal—(i.e., non-defective)—population.**	Condition	MENTAL DULLNESS	MENTAL RETARDATION	T
	Persons	DULLARDS FEEBLY GIFTED	MENTALLY RETARDED	T S
6. **Amentia associated with persistent criminal or immoral conduct.** (For definition, see p. 94.)	Condition	MORAL DEFICIENCY MORAL IMBECILITY	MORAL IMBECILITY MORAL DEVIATION	I
	Persons	MORAL DEFECTIVES MORAL IMBECILES	MORAL IMBECILES MORAL DEVIATES	I

E OF SYNONYMS

	FRENCH.	GERMAN.	TERMS SUGGESTED.
ESS NCY y)	ARRIÉRATION IDIOTIE	SCHWACHSINN SCHWACHSINNIGKEIT BLÖDSINN (Secundärer Blödsinn = Dementia) GEISTESSCHWÄCHE	AMENTIA
VES	ARRIÉRÉS ANORMAUX	SCHWACHSINNIGE BLÖDSINNIGE	AMENTS
	IDIOTIE	IDIOTISMUS IDIOTIE	IDIOCY
	IDIOTS	IDIOTEN	IDIOTS
	IMBÉCILLITÉ	IMBEZILLITÄT	IMBECILITY
	IMBÉCILES	IMBEZILLE	IMBECILES
NESS	DÉBILITÉ MENTALE FAIBLESSE D'ESPRIT	HALBSCHWACHSINNIGKEIT (?) SCHWACHBEFÄHIGKEIT	MOROSIS
ALLY BLE- v been d by	DÉBILES FAIBLES D'ESPRIT	(?) SCHWACHBEFÄHIGTE GEISTIGMINDERWERTIGE LEICHTSCHWACHSINNIGE DEBILE	MORONS
ATION	TARDIVETÉ	(?) SCHWACHBEFÄHIGKEIT SCHWERFÄLLIGKEIT	SIMPLICITAS *vel* STUPIDITAS *vel* FATUITAS
RDED	TARDIFS SUBNORMAUX	GEISTIGZURÜCKGEBLIEBENE SCHWACHBEGABTE SCHWERFÄLLIGE (?) SCHWACHBEFÄHIGTE	SIMPLES *vel* STUPIDS *vel* FATUOUS
TY ON	IMBÉCILLITÉ MORALE	SITTLICHE MINDERWERTIGKEIT MORALISCHE IMBEZILLITÄT MORALISCHER SCHWACHSINN	AMORALIA
ES S	IMBÉCILES MORALES	MORALISCHE SCHWACHSINNIGE MORALISCHE IMBEZILLE	AMORALES

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usual custom in this country. In America the term *feeble-minded* has not this limited connotation, but is applied to the whole order of aments, the words *mental deficiency* (and occasionally *idiocy*) being used as synonyms. The usual French generic terms are *l'arriération* and *l'idiotie;* the usual German term is *Schwachsinn.*

The mildest grade of amentia and the lowest degree of normal intellectual development have been differentiated for some time in England, America, and France, and hence each of these countries possesses tolerably well-recognized terms, as shown in the table. In Germany such differentiation does not seem to be so clearly made, and *Schwachbefähigte* is often used indifferently of the feeble-minded and the dullards. This is the case with several of the other terms shown in the table, and it is perhaps here that the English reader will experience the chief difficulty in knowing which particular class is referred to. The word *moron*, suggested by Dr. H. Goddard, is now the usual American designation for persons suffering from the mildest grade of amentia, and thus corresponds to our *feeble-minded.* So far as I can ascertain, there is no American term for the *state* of this class, and I would suggest *morosis* (Dr. Shuttleworth suggests *moronity*) as a suitable equivalent. With regard to the lowest grade of normal intellectual capacity, it is common in England to apply the term the *dull and backward;* I think, however, that it is clearly advisable to distinguish between mental dullness (which is usually innate) and mental backwardness (which is often merely a symptom of some removable cause), and the innately dull seem to me to be better designated by the English terms *dullards* or *feebly gifted*, than by the American *retarded* or French *tardifs.*

In view of the confusion which exists in the nomenclature of these conditions it would obviously be a great advantage to scientific research if psychiatrists in different countries could come to some common agreement. I have no desire to add to the babel which already exists, and have therefore refrained from introducing any new designations in the preceding pages of this book. I venture to put forward certain terms, however, which might at least form a basis for consideration, and these will be found in column five of the table.

NORMAL DEVELOPMENTAL DATA

Age and Sex.	*Weight.*	*Height.*	*Chest Circumference*	*Cranial Circumference.*	*Brain Weight.*	*Dentition.*	*Mental.*
	Pounds.	Inches.	Inches.	Inches.	Grammes.		
7 days M.	7¼	20½	13½	14	330	—	Sucks vigorously. Distinguishes between sweet and bitter substances placed on the tongue. Eyes often follow a light.
7 days F.	7⅛	20½	13	13½	283	—	
1 mth. M.	8¼	—	—	14½	—	—	Hears sounds. Will notice difference in temperature of milk.
1 mth. F.	7⅛	—	—	14	—	—	
2 mths. M.	10¼	—	—	15	—	—	
2 mths. F.	10	—	—	14½	—	—	
3 mths. M.	12½	23	15	16	602	—	Lifts up head, and will turn head in direction of sounds.
3 mths. F.	12	22½	14½	15½	560	—	
4 mths. M.	13¾	—	—	16½	—	—	Grasps objects voluntarily.
4 mths. F.	13¼	—	—	16	—	—	
5 mths. M.	14¾	—	—	16¾	—	—	Recognizes voice of parents. Tactile sensation present all over body. Looks attentively at objects.
5 mths. F.	14⅝	—	—	16½	—	—	Well-marked motor ideas. Hits on the table, rustles paper, grips an object firmly.
6 mths. M.	15¾	25½	16½	17	712	TEMPORARY.	
6 mths. F.	15½	25	16⅛	16½	670	2 lower central incisors	Begins to notice and recognize objects.
9 mths. M.	17½	—	—	17½	—		Able to sit erect for several minutes at a time. Co-ordinated movements of the hands. Appreciates word symbols, and understands simple commands.
9 mths. F.	17	—	—	17	—		
12 mths. M.	20½	29	18	18	916	4 upper incisors	Attempts to stand.
12 mths. F.	19⅝	28½	17½	17½	816		Able to stand alone.
18 mths. M.	22⅝	30	18½	18½	—	12 teeth are present	Begins to walk. First words.
18 mths. F.	22	29½	18	18	—		Runs about freely.
2 years M.	26½	32½	19	19	990	16 teeth are present	Able to say short baby sentences of two or three words.
2 years F.	25½	32½	18½	18½	890		
3 years M.	31½	35	20½	19½	—	20 teeth present	Constructive faculty seen in ability to build bricks. Knows names and uses of many common objects.
3 years F.	30	35	19½	19	—	—	

3 years	M.	31½	35	20⅛	19½	—	20 teeth present	Constructive faculty seen in ability to build bricks. Knows names and uses of many common objects.
	F.	30	35	19¾	19	—	—	
4 years	M.	35	38	20⅜	19⅜	—	—	Some appreciation of time and space, and able to compare sizes and distances.
	F.	34	38	20⅛	19⅛	—	—	
5 years	M.	41	41½	21⅛	20½	—	—	Knows letters, and able to count.
	F.	39½	41½	21	20	—	—	
6 years	M.	45	44	23½	20⅛	—	PERMANENT. 4 molars	Can read, spell, and write simple words of one syllable.
	F.	43½	43⅜	22⅜	20⅜	—	—	
7 years	M.	49½	46½	23⅜	20⅜	1,138	—	Is able to interpret meaning of simple pictures.
	F.	48	46	23⅛	20⅛	1,135	Incisors	
8 years	M.	54½	48	24½	—	—		Can do Standard I. work.
	F.	53	48	23⅜	—	—	—	
9 years	M.	60	50	25	—	—	—	Can do Standard II. work.
	F.	57½	49½	24⅛	—	—	Bicuspids	
10 years	M.	66½	52	25⅜	21	—		Can do Standard III. work.
	F.	64	52	24⅜	20⅜	—	—	
12 years	M.	80	56	27	21½	—	—	Can do Standard IV. work.
	F.	81½	57	26½	21⅜	—	Canines	
14 years	M.	99	61	28⅜	21⅜	1,301	2nd molars	Can do Standard VI. work.
	F.	100	60½	29⅛	21½	1,154		
15 years	M.	110⅜	63	30	21⅜	—	—	
	F.	108½	61½	30½	21⅜	—	—	
16 years	M.	123¾	65¾	31½	—	—	—	
	F.	113	61⅜	30⅜	—	—	—	

This table is compiled from Holt's "Diseases of Infancy," the observations of R. Boyd, the work of W. Preyer, and a number of observations by the author. The body-weights below five years of age are without clothing; those above that age include ordinary clothing. The object of the table is to provide data regarding the development of the normal child in a convenient form for reference; but it is, of course, to be remembered that the figures are simply the mean averages of a large series of cases, and that the individual variations in some instances may be considerable. This is particularly the case with regard to height, weight, chest circumference, and the eruption of the teeth. In the unfolding of the mental faculties considerable variations also occur, but the cranial circumference in the normal child is much more uniform. Thus, although variations in any one of these particulars may be of little diagnostic importance, variations in several particulars are indicative of general backwardness, and are of great significance.

A TABLE OF ANOMALIES ASSOCIATED WITH AMENTIA

System.	*Organ.*	*Anatomical.*	*Physiological.*
(*a*) Nervous	Brain	General hypoplasia {Anencephaly / Microcephaly} Partial hypoplasia of cortex, ganglia, and internal structures Hyperplasia (sclerosis)	Insanity and epilepsy; various psychoses and neuroses; defects of speech; various abnormal nerve signs; various forms of paralysis; defects of posture, walking, and general balance
	Spinal cord	Micromyelia; syringomyelia; local hypoplasias; spina bifida	
(*b*) Special senses	Ear	Anomalies of form and size of pinna and component parts; attachment of lobes to cheeks; supernumerary lobules	Defects of hearing (but more often due to disease than to developmental anomalies)
	Eye	Epicanthus; obliquity of fissures; coloboma; heterophthalmos; persistence of pupillary membrane; opacity of media; strabismus; astigmatism; errors of refraction; cataract	Visual defects; conjunctivitis; keratitis; blepharitis
	Nose	Anomalies of form and size	Defects and perversions of smell
	Lips	Anomalies of form and size (hare-lip uncommon)	Defects of articulation; slavering
	Tongue	Anomalies of size; fissures; hypertrophied papillæ	Defects and perversions of taste
(*c*) Osseous	Cranium	Abnormalities of size and shape; asymmetry; bosses	
	Palate	Saddle- and V-shaped	
	Jaws	Small and receding, or occasionally protruding	

	Jaws	Small and receding, or occasionally protruding	
	Teeth	Irregularities of position, number, form, size, and condition	Primary and secondary dentition often delayed
	Limbs	Gigantism, dwarfism; talipes; deformities of fingers and toes; polydactylism, syndactylism: arms disproportionately long; legs short and bowed	Defects of prehension, balance, and progression
(*d*) Muscular and cutaneous	Skeletal muscles	Numerous anomalies	
	Skin	Moles; nævi; supernumerary mammæ; hair arranged in multiple cortices; an unusual development of hair upon parts generally hairless, and an absence or deficiency on those usually covered; adenoma sebaceum	Excessive and unpleasant secretion Diminished secretion and dryness
(*e*) Circulatory and respiratory	Heart	Subnormal size Fœtal malformations	Feeble circulation; cyanosis; chilblains; subnormal temperature
	Bloodvessels	Various aberrations	Hæmophilia
(*f*) Alimentary	—	Numerous anomalies of stomach, alimentary canal, and glands	Bulimia; coprophagia
(*g*) Urinary and generative	Kidneys and bladder	Lobulated, horseshoe; extroversion of the bladder	
	Male genitals	Epi- and hypo-spadias; cryptorchism; infantilism; cloacal opening	Late puberty; sterility
	Female genitals	Small uterus; fibrous ovaries; labial anomalies; cloacal opening; infantilism	Abnormal presentations; abortions; sterility

FORM FOR CASE-TAKING.

Name.

Address.

Sex. Age. Date of Examination.

A.—PREVIOUS PERSONAL HISTORY

Information supplied by
Reason for seeking advice.
When and what was the abnormality first noticed.

1. *Physiological Development :*

First tooth. Walked. Talked.
Clean in habits. Puberty.

2. *Medical History :*

Illnesses. Accidents. General state of health.
Condition of mother during pregnancy.
Any abnormality at birth.

3. *School History :*

Age when began. Kind of school. Attendance.
Age at leaving. Standard reached.

4. *General Behaviour and Disposition :*

Cheerful.	Depressed.	Good-tempered.	Bad-tempered.
Affectionate.	Quarrelsome.	Alcoholic.	Cruel.
Destructive.	Mischievous.	Obedient.	Disobedient.
Obstinate.	Honest.	Dishonest.	Criminal.
Truthful.	Untruthful.	Modest.	Immodest.

5. *Abilities :*

Feed himself. Wash and dress.
Guard against ordinary physical dangers.
Do manual work. Go errands.
Any regular employment. Any special talents or tastes.

B.—FAMILY HISTORY.

Brothers and Sisters. *Parents, Uncles and Aunts.* *Grandparents.*

1. .....
2. ..... F.B.
3. ..... F.S.
4. ..... F. ..... F.F. .....
5. ..... F.M. .....
6. ..... M. ..... M.F. .....
7. ..... M.B.
8. ..... M.S. M.M. .....

C.—PRESENT STATE.

Age. Date of examination.

General appearance.

1. PHYSICAL:

Height. Weight. Skull. (Size, shape, and abnormalities.)

General development and nutrition.

Developmental Anomalies and Stigmata :

Face. Eyes. Ears. Nose Mouth.
Tongue. Palate. Teeth. Jaws. Skin.
Hands. Feet. Limbs. Body. Genitals.

Signs of Ill-Health or Disease :

Heart. Lungs. Abdomen. Glands. Tonsils.
Adenoids. Constitutional disease—*e.g.*, rickets, anæmia.

2. MENTAL—*Sensation :*

Sight.
Hearing.
Tactile.

Cerebration :

Attention.
Association.
Memory.
Reasoning.
Temperament.
Emotion.

Action :

Speech.
Movement + or −.
Co-ordination.
Tricks and habits.
Convulsions.
Reflexes.

Binet and Simon's Tests :

3. CAPABILITIES—*Scholastic :*

Reading.
Writing.
Sums.
Money values.

Manual :

Special Aptitudes :

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DIAGNOSIS AND REMARKS.

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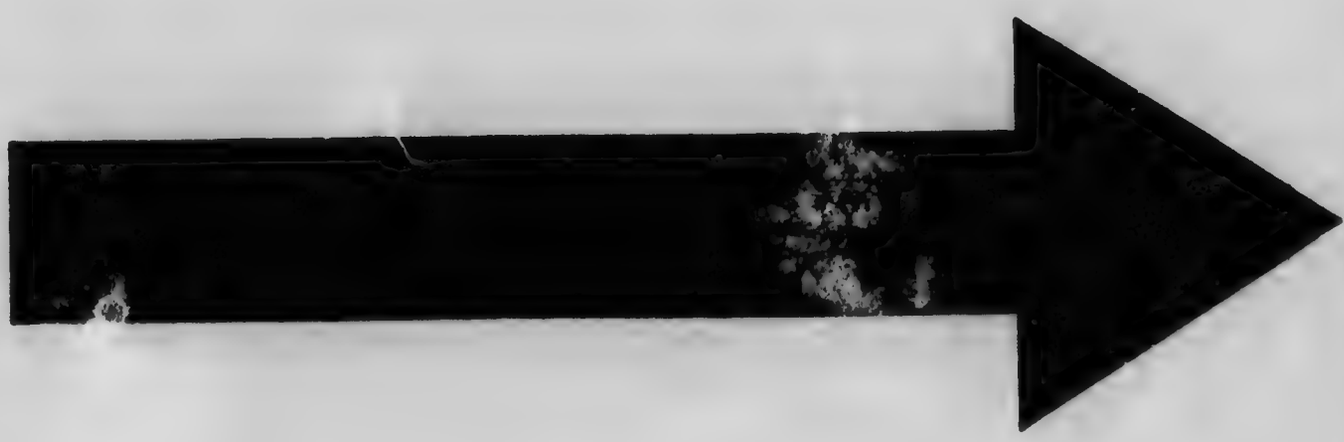

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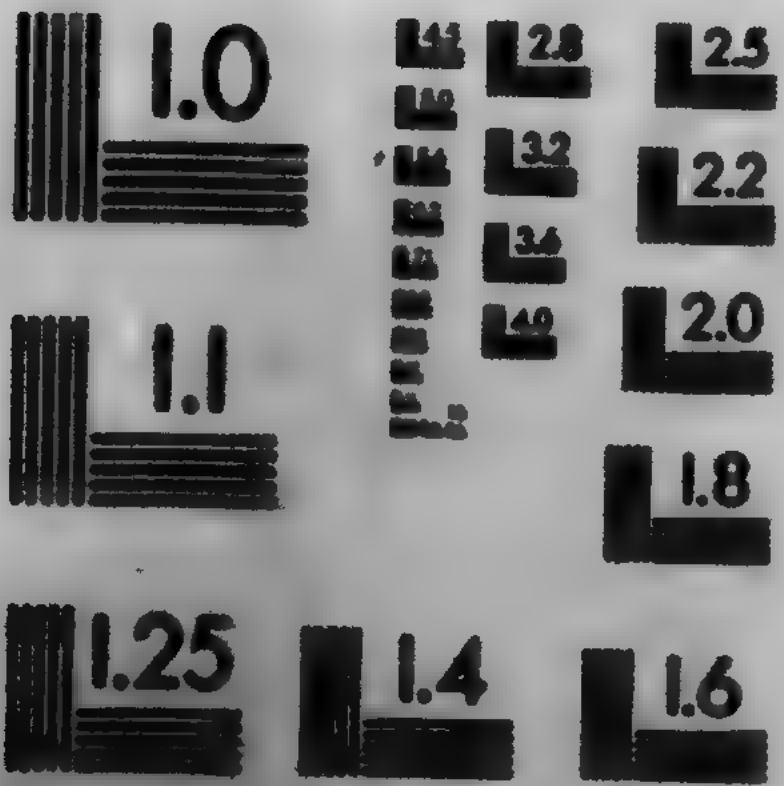

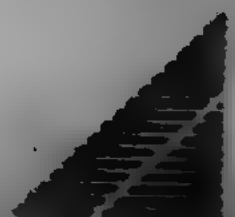

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